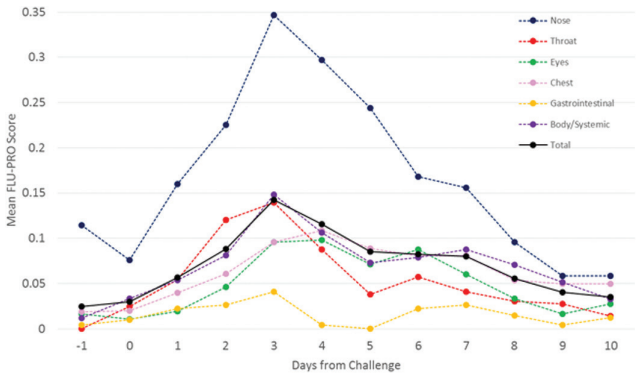
Figure 1. Trajectory of FLU-PRO scores from pre-challenge to Day 10 post-challenge



Disclosures. **J. L. Poon**, Evidera: Employee, Salary; **R. Yu**, Evidera: Employee, Salary; **N. K. Leidy**, Evidera: Employee, Salary

1967. Predictors of Clinical Respiratory Virus Testing Among Adults Hospitalized with Acute Respiratory Illness (ARI) (2015–2016)

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Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. Vaccine effectiveness (VE) studies require an accurate indicator of influenza infection, often obtained through research testing independent of clinical (physician-ordered) testing. Clinical testing could be used to detect influenza in these studies if factors associated with clinical testing for influenza were better understood.

Methods. Adults hospitalized with ARI at three study sites during the study period were enrolled in CDC's 2015–16 Hospitalized Adult Influenza Vaccine Effectiveness Network (HAIVEN) study and tested for influenza by RT-PCR. Clinical testing information, presenting symptoms, and patient characteristics were collected from medical records and patient interview. Logistic regression was used to estimate odds of receiving a clinical test based on age, vaccination status, comorbidities, presentation with influenza-like illness (ILI; defined as fever and cough or sore throat) and other factors.

Results. Of 895 enrollees, 571 (64%) patients meeting study inclusion criteria received physician-ordered testing. Of these, 53% had a multipathogen panel, 13% had a rapid antigen test, 7% had singleplex PCR, <1% had viral culture, and 27% had multiple tests; influenza infection was detected in 55 (6%) patients. Of 150 influenza cases identified by study testing, 25 (17%) were not tested clinically. Enrollees who did not receive clinical testing were older, had longer time to admission, and were less likely to present with ILI. Immunosuppressive disorders (aOR=2.05), non-COPD lung conditions (aOR=1.68), presentation with ILI (aOR=4.03), and admission ≤2 days from symptom onset (aOR=1.89) were positively associated with receiving a clinical test ($P < 0.01$ for all; Figure 1). After adjusting for these factors, enrollees with influenza vaccination were 37% less likely (aOR=0.63) to receive a clinical test ($P < 0.01$).

Conclusion. Patients with ARI who were clinically tested for influenza differed from those not tested. A lower likelihood of testing among influenza positive vaccinees could potentially bias VE estimates upward and requires further evaluation. Clinical testing alone may fail to detect a substantial proportion of influenza cases.

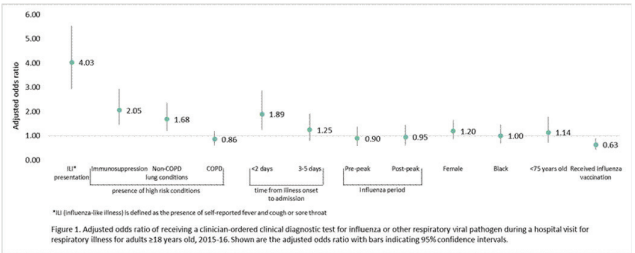

Figure 1. Adjusted odds ratio of receiving a clinician-ordered clinical diagnostic test for influenza or other respiratory viral pathogen during a hospital visit for respiratory illness for adults ≥18 years old, 2015-16. Shown are the adjusted odds ratio with bars indicating 95% confidence intervals.

Disclosures. **All authors:** No reported disclosures.

1968. A Cross-Sectional Surveillance Study of Acute Respiratory Illness (ARI) in Pregnant Women

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Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. Among pregnant women, pneumonia is the third-leading cause of death and the most common non-obstetric infection resulting in death. Pregnant women who become infected with influenza have hospitalization rates comparable to non-pregnant women with high-risk medical conditions. Other than influenza, little is known about the consequences of viral-related ARI on the pregnant woman and the fetus. Our objective was to determine the respiratory viruses causing ARI and their clinical outcomes during pregnancy.

Methods. Pregnant women in their second and third trimester were enrolled prospectively at a Houston clinic between October 1, 2015 and April 30, 2016 during their regular prenatal visits. Pregnant women were enrolled if they reported having symptoms of ARI or were healthy within the preceding two weeks. Nasal-pharyngeal secretions were evaluated for respiratory viruses by real time-PCR. Clinical outcomes and complications of illness were obtained at enrollment and two weeks after the initial visit.

Results. A total of 155 pregnant women were enrolled. The average age at enrollment was 30.7 years among women with ARI and 29.7 among healthy controls. Average gestational age at enrollment was 26.0 weeks among women with ARI and 26.3 among healthy controls. Among the 91 healthy controls, 10 (11%) tested positive for a respiratory virus, with rhinovirus ($n = 6$) being the most common of the viruses detected. On the other hand, of the 81 cases of ARI, 51 (63%) tested positive for a virus. The most frequently detected viruses were rhinovirus ($n = 22$), coronavirus ($n = 14$), and respiratory syncytial virus ($n = 8$). Twelve patients reported fever during the course of their ARI. Seventeen ARI patients reported at least one symptom of lower respiratory tract illness (LRTI). Of those patients with LRTI, two reported decreased fetal heart rate and one was hospitalized for her illness.

Conclusion. Respiratory viruses were frequently detected in pregnant women with ARI. One-third of pregnant women with viral ARI had evidence of LRTI. Hospitalization and non-reassuring fetal heart tones were among the complications reported by pregnant women with LRTI. Viral ARI during pregnancy appears common and is associated with significant morbidity.

Disclosures. **All authors:** No reported disclosures.

1969. Burden of Community-Acquired Pneumonia due to PCV-13 *Streptococcus pneumoniae* Serotypes Among Hospitalized Adults in the United States

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Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. The burden of disease for US adult patients hospitalized with community-acquired pneumonia (CAP) due to *S. pneumoniae* (Sp) PCV13 vaccine types (VT) is not known. The objective of this study was to determine the incidence, patients' characteristics, length of stay and mortality for US adults hospitalized with CAP due to Sp-PCV13VT.

Methods. This was a prospective observational study of adults hospitalized between October 7, 2013 and September 30, 2016 with radiographically confirmed CAP in 19 centers in the US. Patients were included if the following 5 criteria were met: 1) Age 18 years and older; 2) Presence of two or more of the following: fever, hypothermia, chills or rigors, pleuritic chest pain, cough, sputum production, dyspnea, tachypnea, malaise, and abnormal auscultatory findings suggestive of pneumonia; 3) Radiographic finding consistent with pneumonia; 4) Able to provide urine sample; 5) Signed informed consent. The presence of Sp-PCV13VT was investigated using a Luminex-based urinary antigen detection (UAD) assay or serotyping from a positive Sp isolate. Data on patients' characteristics, length of stay (LOS) and in-hospital mortality (IHM) were collected.

Results. From a total of 12,055 hospitalized patients with CAP, VT Sp-PCV13 was detected in 552 patients via UAD or culture (4.6%). Among patients hospitalized with CAP due to Sp-PCV13VT, median age was 64 years, and the most common comorbidities were chronic obstructive pulmonary disease (46.2%) and diabetes (27.3%). Median LOS was 6 days, and IHM was 5.4%. There were no clinically significant differences when this population was compared with the population of patients with non-PCV13 VT Sp-CAP.

Conclusion. In approximately 5% of US adults hospitalized with CAP, the etiologic agent is VT Sp-PCV13. Clinical characteristics and outcomes in this population were similar when compared with the general population of hospitalized patients with CAP. In conclusion, this study indicates a persistent burden of disease for adult patients hospitalized with CAP due to vaccine preventable Sp serotypes.

Disclosures. **All authors:** No reported disclosures.

1970. Frailty Hinders Recovery From Acute Respiratory Illness in Older Adults

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Duncan Webster, MD[19]; Lingyun Ye, MSc[1] and Shelly McNeil, MD, FRCPC, FIDSA[1]; [1]Canadian Center for Vaccinology, IWK Health Centre and Nova Scotia Health Authority, Dalhousie University, Halifax, NS, Canada, [2]Division of Geriatrics, Division of Infectious Diseases, Department of Medicine, Dalhousie University, Halifax, NS, Canada, [3]Health Sciences North Research Institute, Sudbury, ON, Canada, [4]Centre Hospitalier Universitaire de Quebec, Quebec City, QC, Canada, [5]Division of Infectious Diseases, Department of Medicine, University of British Columbia, Vancouver, BC, Canada, [6]Mount Sinai Hospital, Toronto, ON, Canada, [7]Nova Scotia Health Authority, Dalhousie University, Halifax, NS, Canada, [8]McMaster University, Hamilton, ON, Canada, [9]North York General Hospital, Toronto, ON, Canada, [10]St. Boniface Hospital, Winnipeg, MB, Canada, [11]The Ottawa Hospital, Ottawa, ON, Canada, [12]Michael Garron Hospital, Toronto, ON, Canada, [13]William Osler Health System, Brampton, ON, Canada, [14]McGill University, Montreal, QC, Canada, [15]Division of Infectious Diseases, Department of Medicine, University of Alberta Hospital, Edmonton, AB, Canada, [16]The Moncton Hospital, Moncton, NB, Canada, [17]Division of Infectious Diseases, University of Alberta Hospital, Edmonton, AB, Canada, [18]Microbiology and Infectious Disease, Université de Sherbrooke, Sherbrooke, QC, Canada, [19]Saint John Regional Hospital, Dalhousie University, Saint John, NB, Canada

Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. Influenza vaccination programs aim to prevent serious outcomes. Given that frailty may impact recovery from influenza, we examined frailty as a predictor of recovery in older adults hospitalized with acute respiratory illness.

Methods. Data came from the Canadian Immunization Research Network (CIRN) Serious Outcomes Surveillance (SOS) Network during the 2011/12, 2012/13, and 2013/14 influenza seasons; all patients were aged 65+. Frailty was measured using a previously validated Frailty Index (FI) of health and functional deficits; baseline frailty was categorized using published cutoffs (0-.1 non-frail, >.1-.21 pre-frail, >.21-.45 frail, >.45 most frail). Recovery was operationalized as being alive 30 days post-discharge with less than two additional health/functional deficits (<=0.06 FI increase). Logistic regression was used to examine the change in odds of recovery for every 0.1 increase in baseline FI, controlling for age, sex, season, lab-confirmed influenza status, and seasonal influenza vaccination status.

Results. Of 5125 hospitalized older adults, 15% were non-frail, 39% pre-frail, 40% frail, and 6% most frail. 11% died, and poor recovery was experienced by 520/4544=11% of survivors. Poor recovery was inversely associated with baseline frailty (11% non-frail, 17% pre-frail, 28% frail, 38% most frail; $P < .001$). Frailty was associated with lower odds of recovery in all three seasons [2011/12 (OR=0.71; 95% CI 0.60–0.85), 2012/13 (OR=0.72; 0.66–0.78), 2013/14 (OR=0.76; 0.70–0.82)] though results varied by season, influenza status, and vaccination status. In 2011/12, frailty was associated with poor recovery in unvaccinated (OR=0.46. 95% CI=0.32–0.67) but not vaccinated older patients (OR=0.83, 95% CI=0.68–1.02).

Conclusion. Increasing frailty was consistently associated with lower odds of recovery in older adults admitted with influenza and other acute respiratory illnesses; depending on seasonal factors, vaccination may offer some buffering of this impact. Understanding frailty and functional status is important, both because frailty is predictive of poor recovery and because persistence of new health/functional deficits is an adverse outcome with important implications for patients, families and health systems.

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1971. Impact of Procalcitonin Guidance on Management of Adults Hospitalized with COPD Exacerbations

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Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. Antibiotics are often prescribed for hospitalized patients with chronic obstructive pulmonary disease (COPD) exacerbations. The use of procalcitonin (PCT) in the management of pneumonia has safely reduced antibiotic durations, but there remains limited data on the impact of PCT guidance on the management of COPD exacerbations.

Methods. A retrospective, pre-intervention/post-intervention study was conducted to compare the management of patients admitted with COPD exacerbations before and after implementation of PCT guidance at two teaching hospitals in Pittsburgh, Pennsylvania. The pre-intervention period was 3/1/2014–10/31/2014, and the post-intervention period was 3/1/2015–10/31/2015. The primary outcome was duration of antibiotic therapy for COPD. Secondary objectives included duration of IV antibiotics, duration of inpatient length of stay (LOS), and 30-day readmission rates.

Results. There were no differences in mean age (66.2 vs 65.9; $P = 0.82$) or use of home oxygenation (65% vs 61%; $P = 0.67$) in the pre-intervention and post-intervention groups, respectively. Primary and secondary outcomes can be seen in Table 1.

In the post-intervention group, 16/139 (11.5%) patients had an elevated PCT (> 0.25 µg/L). Patients with an elevated PCT received longer durations of antibiotics compared with those with low PCT levels (5.3 vs 2.7; $P = 0.001$).

Table 1: Treatment duration and outcomes of total cohorts

	Pre- Intervention (n = 166)	Post-Intervention (n = 139)	P value
Duration of total antibiotics, mean (SD), days	5.3 (3.2)	3.0 (2.9)	0.01
Duration of IV antibiotics, mean (SD), days	2.5 (2.4)	1.9 (1.8)	0.02
Duration 0–1 days, n (%)	24 (14.5)	61 (43.8)	
Duration 2–5 days, n (%)	73 (44.0)	48 (34.6)	
Duration 6–7 days, n (%)	37 (22.3)	18 (13.0)	
Duration 8–10, n (%)	23 (13.8)	10 (7.2)	
Duration 11–14, n (%)	8 (4.8)	2 (1.4)	
Duration > 14, n (%)	1 (0.6)	0 (0)	
Inpatient LOS, mean (SD), days	4.1 (3.9)	2.9 (2.0)	0.01
Readmission within 30 days, n (%)	24 (14.5)	23 (16.6)	0.25
Respiratory related 30-day readmission, n (%)	18 (10.8)	13 (9.4)	0.18

SD= standard deviation

Conclusion. Utilizing PCT guidance in the management of COPD exacerbations decreased both the total duration of antibiotic therapy and hospital LOS without negatively impacting hospital readmissions.
Disclosures. **All authors:** No reported disclosures.

1972. Measles Morbidity and Mortality in the Developed World are Greater than the Public Perceives

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Session: 233. Clinical: Respiratory Track
Saturday, October 7, 2017: 12:30 PM

Background. Measles mortality and morbidity are staggering in the developing world partly because of widespread malnutrition. In the U.S. and other developed countries, individuals with compromised cellular immunity from immune-suppressive treatments and HIV are also at increased risk of measles complications; however measles is perceived by many as a routine childhood illness of little consequence. Misinformation about alleged risks of measles containing vaccines (MCV) has led to continued endemic and epidemic measles in the developed world.

Methods. Present CDC data and data published by one of us (JDC) are reviewed for measles morbidity and mortality. The categories examined included: deaths, encephalitis, subacute sclerosing panencephalitis (SSPE) and post measles immune amnesia (PMIA). Data are presented as rates per 100,000 per year and are stratified by age, sex and degree of immune competence.

Results. The following approximate numbers per 100,000 cases in immunocompetent persons were determined: deaths – 200; encephalitis – 100; SSPE – 100; PMIA – 12. Ratios for death and SSPE were higher in males and in infants. The infant with measles will have an overall risk of a severe outcome (death, SSPE or encephalitis of 1:215). Similarly, the risk in an older child would be 1:379. The risk in males is greater than in females. The risk for death due to PMIA is small; however, the risk of specific diseases such as pneumonia and meningitis are considerable.

Conclusion. Measles is endemic and epidemic in Europe, much of Asia, and in Africa. Therefore, importations into the U.S. will continue to occur and non-immune persons will get measles.

To prevent the extended morbidity and mortality as described, and to protect those who cannot receive a MCV, extended immunization efforts need to be carried out in the U.S. These efforts include: giving the second dose of a measles, mumps, rubella (MMR) vaccine at 15 months rather than 4–6 years, fill immunization gaps by seeing that they all have received 2 doses of a MCV or have demonstrated serum antibody to measles virus in adults, and discourage travel to measles endemic and epidemic areas by all persons who are not immune (infants < 1 yr of age and persons who have not received 2 doses of vaccine or have evidence of measles serum antibody).

Disclosures. **All authors:** No reported disclosures.