oseltamivir (for 1 and 20 days) at the time of specimen collection, and antiviral receipt was unknown for 4. Three (23%) patients were hospitalized; there were no deaths.

Conclusion. During the 2016–2017 and 2017–2018 influenza seasons, influenza A(H1N1)pdm09 viruses resistant to both oseltamivir and peramivir were infrequently detected; all retained susceptibility to zanamivir. Among those with available information, half had no exposure to oseltamivir. Viruses harboring H275Y continue to circulate at low levels in the community. Ongoing surveillance for trends in oseltamivir- and peramivir-resistant A(H1N1)pdm09 is critical to inform clinical care and public health policies.

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746. Characteristics of Respiratory Syncytial Virus (RSV) Infection Among Hospitalized Adults, United States, 2014–2017

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Background. Respiratory syncytial virus (RSV) vaccines are in clinical development for older adults. We described RSV infections among adults requiring hospitalization and risk factors for severe outcomes using a population-based platform, the Influenza Hospitalization Surveillance Network (FluSurv-NET).

Methods. Surveillance occurred October 1–April 30 (2014–2017) at sites located in seven states (California, Georgia, Michigan, Minnesota, New York, Oregon, and Tennessee) covering an annual catchment population of up to 13 million adults ≥18 years. Laboratory-confirmed RSV cases were identified using hospital and state public health laboratories, hospital infection preventionists, and/or reportable condition databases. Medical charts were reviewed for demographic and clinical data. International Classification of Diseases (ICD) discharge codes were abstracted. Odds ratios (Oregon) and 95% confidence intervals (CIs) were determined to assess risk factors for ICU hospitalization and deaths.

Results. A total of 2,326 hospitalized RSV cases were identified. Over half were ≥65 years (62%, n = 1,438/2,326), female (59%, n = 1,362/2,326), white (70%, n = 1,301/1,855), and had ≥3 underlying medical conditions (52%, n = 1,204/2,326). 20% (n = 398/2,000) were hospitalized in the ICU (median length of stay, 3 days; interquartile range, 1–6 days), and 5% (n = 96/2,001) died in the hospital. Congestive heart failure (CHF; OR: 1.4, 95% CI: 1.1–1.8) and chronic obstructive pulmonary disease (COPD; OR: 1.3, 95% CI: 1.1–1.7) were associated with ICU admission, while age ≥80 years (OR: 4.1, 95% CI: 1.8–12.1) and CHF (OR: 2.4, 95% CI: 1.6–3.6) were associated with in-hospital deaths. RSV-specific ICD codes were listed in the first 9 positions in only 44% (879/1,987) of cases.

Conclusion. To our knowledge, this is the largest US case series of RSV-infected hospitalized adults. Most cases were ≥65 years and had multiple underlying medical conditions. Older age, CHF, and COPD were associated with the most severe outcomes. Few cases had RSV-specific ICD codes, suggesting that administrative data underestimate adult RSV-related hospitalizations. Continued surveillance is needed to understand the epidemiology of RSV among adults as vaccine products move toward licensure.

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747. Antibiotic Therapy for Community-Acquired Pneumonia: A Systematic Review and Network Meta-Analysis of Randomized Trials

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Background. Community-acquired pneumonia (CAP) is one of the top causes of life-years lost globally. The optimal empiric antibiotic therapy regimen is uncertain. Randomized controlled trials (RCTs) provide useful information about relative antibiotic effectiveness.

Methods. We systematically searched Medline, EMBASE, and CENTRAL for RCTs comparing at least two empiric antibiotic regimens in patients with CAP, to March 17, 2017. We performed a systematic review and network meta-analysis and network meta-regression using a Bayesian framework. We used GRADE to assess certainty in the effect estimates.

Results. From 18,056 citations, we included 303 RCTs. Most studies (69.9%) were not blinded. All networks had low global heterogeneity (I^2 0%). There were 26,423 participants included in the analysis of mortality and 30,559 for treatment failure. Seven hundred and twenty-six (2.9%) participants died. Patients randomized to third generation cephalosporins alone had higher mortality than those randomized to early generation fluoroquinolones (risk ratio [RR] 2.08, 95% credible interval 1.17–3.90), later generation fluoroquinolones (RR 2.32, 1.44–4.26), and cephalosporin-fluoroquinolone combinations (RR 3.21, 0.99–12.49). Participants who were randomized to a cephalosporin plus macrolide were less likely to die than those who received a third generation cephalosporin alone (RR 0.47, 0.21–0.99). The evidence was similar for treatment failure. B-lactam plus β-lactamase inhibitors (e.g., piperacillin–tazobactam), early generation cephalosporins, and daptomycin appeared to confer a higher risk of mortality and/or treatment failure than most other antibiotic regimens including third-generation cephalosporins alone. For key comparisons, the GRADE quality of evidence was low or moderate.

Conclusion. In patients with CAP, an antibiotic regimen that includes a fluoroquinolone (and possibly a macrolide) may reduce mortality by ~1–2% compared with β-lactams (with or without a β-lactamase inhibitor) and cephalosporins alone. High quality, blinded and pragmatic randomized evidence would be helpful to increase certainty in the evidence.

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748. The Impact of a Positive Respiratory Viral Panel Among Hospitalized Adult Patients with Negative Rapid Influenza Testing at an Academic Tertiary Care Facility: A-matched Cohort Study

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Background. Multiplex nucleic acid amplification assays (NAATs) are increasingly used to evaluate respiratory illnesses. Viral diagnosis has the potential to change clinical management and, specifically, decrease antibiotic use. However, the assays are expensive, and their effect on clinical management is unknown. This study evaluated the incremental impact of a multiplex respiratory viral panel after negative rapid influenza testing.

Methods. We completed a retrospective review of all adult patients with respiratory viral panel (RVP; GenMark) and/or rapid influenza or RSV/influenza PCR tests (PCR; Cepheid Xpert) collected within 48 hours of admission to non-ICU, inpatient units from September 1, 2015 to April 15, 2016. We matched hospitalizations with a positive RVP simultaneously with or following negative PCR testing (PCR–RVP+) 1:1 with patient encounters with negative rapid PCR testing only (PCR–). Matching of the referent PCR-group occurred without replacement based on age (±10 years), sex, race, season of testing (±50 days), and any respiratory viral test in the prior 30 days. The primary outcome was a change in management, defined as antimicrobial de-escalation (discontinuation, switch from intravenous to oral administration, and/or narrowing of spectrum), antiviral initiation, and/or change in isolation precautions.

Results. During the study period, there were 153 PCR–RVP+ patient encounters and 524 with PCR– testing only from which we identified 134 matched pairs. In the matched cohort, the median age was 60 years (IQR: 41–71), 47.8% were female, and 34.3% were non-White. Respiratory viral testing was associated with management change in 3.7% of PCR– and 23.9% of PCR–RVP+ patients (risk difference 20.1%; 95% CI 12.2–28.0%). Antimicrobial de-escalation did not occur after testing for any PCR- patients but did occur for 15.7% of PCR–RVP+ patients (95% CI 9.5–21.8%).

Conclusion. Among patients with negative rapid influenza testing, a subsequent or simultaneous positive RVP was associated with a higher frequency of antibiotic de-escalation. This suggests multiplex NAATs could play a role in improving antimicrobial stewardship in the setting of respiratory illness.

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749. Healthcare Utilization After Hospitalization for Respiratory Syncytial Virus or Unspecified Bronchiolitis in the First Year of Life

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Background. Respiratory syncytial virus (RSV) is the leading cause of infant hospitalizations and risk varies by gestational age (GA). Healthcare utilization following early hospitalizations caused by RSV (RSVH) or unspecified bronchiolitis (UBH) is not well understood. This study examined healthcare resource utilization (HRU) across GA categories within 12 months after an initial RSVH or UBH occurring in the first year of life.

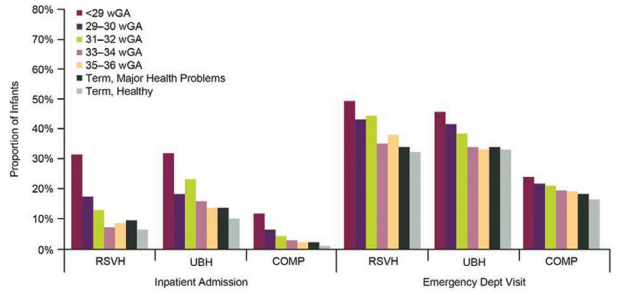
Methods. Infants born July 1, 2009 to June 30, 2015 were identified in the MarketScan Commercial (COM) and Multistate Medicaid (MED) databases and assigned to GA categories using DRG and ICD codes and to an initial hospitalization cohort using inpatient claim diagnosis codes (RSVH, UBH without RSVH, or COMP [a comparator without RSVH or UBH]). Index dates (first admission dates for hospitalized infants) were assigned to COMP infants using times from birth to index dates among RSVH infants. HRU (hospitalizations, outpatient pharmacy fills, and visits for emergency department [ED], urgent care, wellness, other office or outpatient) excluded index hospitalizations and was assessed from 14 days post-index (or discharge if later) through 12 months post-index. Results were propensity score weighted to balance pre-index characteristics (age, sex, region, GA, birth hospitalization characteristics) across cohorts. Proportions were compared with chi-squared tests.

Results. Among all infants (all GA categories combined), the proportions of RSVH and UBH cohorts with follow-up hospitalizations or ED visits were greater ($P < 0.05$) than COMP (hospitalizations: COM +5.8%, +9.3%; MED +9.1%, +12.0%; ED visits: COM +15.8%, +16.2%; MED +14.4%, +17.1%). Follow-up hospitalizations in COM and MED and ED visits in COM declined with greater GA (Figures 1 and 2). HRU in other categories (fills, visits) was significantly ($P < 0.05$) greater among RSVH or UBH infants relative to COMP for nearly all GA categories in both COM and MED.

Conclusion. Infants hospitalized for RSV or UB in their first year of life had greater use of inpatient and outpatient resources in the 12 months following their initial hospitalizations compared with nonhospitalized infants. Inpatient care during follow-up was greatest among infants born at earlier GA.

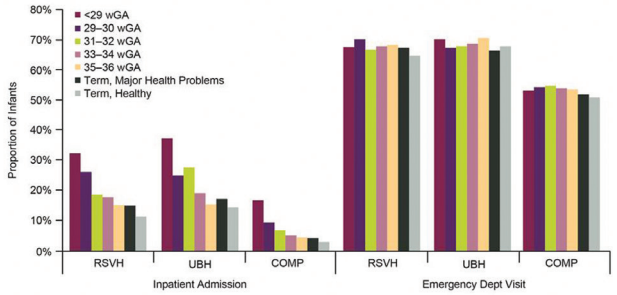
Funded by AstraZeneca

Figure 1. Healthcare Resource Utilization During Follow-up (Commercial)*



*All within cohort RSVH/ COMP and UBH/ COMP comparisons were significant ($P<0.05$).
Abbreviations: COMP, comparator without RSVH or UBH; RSVH, respiratory syncytial virus hospitalization; UBH, unspecified bronchiolitis hospitalization; wGA, weeks gestational age.

Figure 2. Healthcare Resource Utilization During Follow-up (Medicaid)*



*All within cohort RSVH/ COMP and UBH/ COMP comparisons were significant ($P<0.05$).
Abbreviations: COMP, comparator without RSVH or UBH; RSVH, respiratory syncytial virus hospitalization; UBH, unspecified bronchiolitis hospitalization; wGA, weeks gestational age.

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750. Respiratory Virus Infections and Airflow Obstruction After Allogeneic Hematopoietic Cell Transplantation

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Background. Respiratory viruses are readily detectable in hematopoietic cell transplant (HCT) recipients in the molecular diagnostic era. The association of respiratory virus infections with acute and chronic airflow obstruction (AFO) is poorly defined.

Methods. HCT recipients were prospectively followed with weekly handheld spirometry and symptom questionnaires through 1 year after HCT. Weekly multiplex PCR testing for 11 respiratory viruses was performed through day 100 post-HCT and every 3 months and with respiratory symptoms thereafter. Standard pulmonary function testing occurred at recommended intervals. Cox proportional hazard models were used to correlate longitudinal symptomatic respiratory tract viral infections with AFO phenotypes, defined as 2- or 4-week decline (↓) of 1 second forced expiratory volume (FEV1) >10% by handheld spirometry; late AFO (FEV1/forced vital capacity [FVC] < lower limit normal predicted and FEV1 decline >10% from baseline at 3 years; or bronchiolitis obliterans syndrome (BOS; FEV1 <75%, FEV1/FVC < 0.7, and FEV1 ↓ >10% from baseline) by 3 years after HCT; late AFO and BOS were assessed by standard pulmonary function testing.

Results. Overall, 7,091 PCR tests were performed in 471 patients; 70% of patients had ≥1 respiratory virus detected. Among 437 patients who survived >4 weeks, decline of FEV-1 for 2 or 4 weeks, late AFO or BOS occurred in 11.9%, 7.1%, 15.6%, and 3.9%, respectively. In adjusted Cox models, human metapneumovirus (HMPV), influenza virus A/B, and parainfluenza virus 1–4 (PIV) upper tract infections (URI) were associated with 2 and 4 weeks FEV-1 decline (Figure 1). Late AFO and BOS were only significantly associated with RSV- or HMPV-related URI (Figure 2). Lower respiratory disease (LRD) due to HMPV (adjusted HR 11.1, $P = 0.02$) was associated with a 2- and 4-week FEV-1 decline.

Conclusion. Development of AFO after HCT is common. Respiratory viruses are significantly associated with both short-term airflow decline and long-term airflow obstruction. Interventional strategies that target multiple viruses are warranted.

Figure 1. Association of first respiratory virus URIs with 2-week airflow decline by handheld spirometry. Results from univariate (blue) and multivariable models (*orange; separate for each virus category; adjusted for recipient sex) are shown (categories without HRs have too few events to fit the model).