Salt Lake City, UT; [16]Connecticut Emerging Infections Program, New Haven, Connecticut

Session: P-68. Respiratory Infections - Viral

Background. Older adults account for tens to hundreds of thousands of influenza-associated hospitalizations annually. Diabetes mellitus (DM) is common among patients hospitalized with influenza, yet data are limited on the impact of DM on influenza-associated hospitalizations. We compared influenza-associated hospitalization rates among older adults living with and without DM

Methods. We included adults ≥65 years hospitalized with influenza during 2012–13 through 2016–17 from the Influenza Hospitalization Surveillance Network (FluSurv-Net), a population-based surveillance system for laboratory-confirmed influenza-associated hospitalizations conducted in defined catchment areas within 13 states. Influenza testing is clinician-directed, and surveillance officers identify cases through infection control logs, laboratory records and other disease reporting systems. Data on underlying conditions, including DM, were abstracted from medical records Population denominators were calculated using county-specific estimates of DM prevalence from the Centers for Medicare and Medicaid Services. We calculated hospitalization rates by state and season, and present pooled rates and rate ratios, with 95% confidence intervals (CI), using meta-analysis with state as a random effect.

Results. Of 31,934 patients included in the analysis, 34% had DM. DM prevalence in the FluSurv-Net source population aged ≥65 years was 25%. Accounting for variability by state, the average influenza-associated hospitalization rate per 100,000 person years from 2012-13 through 2016-17 was 276 (95% CI: 230–330/100,000) in those with DM and 181 (95% CI:150–217/100,000) in those without DM. Though the magnitude of the association varied by season, hospitalization rates among those with DM was consistently greater than those without DM (pooled rate ratio: 1.57; 95% CI: 1.43–1.72; P< .0001).

Conclusion. Older adults have high influenza-associated hospitalization rates, and those with DM have a 57% increased risk compared to those without DM. These findings reinforce the importance of annual influenza vaccination in adults ≥65 years of age, particularly those with DM.

Disclosures. Nisha B. Alden, MPH, CDC (Grant/Research Support) Evan J. Anderson, MD, Sanofi Pasteur (Scientific Research Study Investigator) Sue Kim, MPH, Council of State and Territorial Epidemiologists (CSTE) (Grant/Research Support)

1505. Antiviral and Antibiotic Prescribing Among Patients at an Ambulatory Cancer Center with Laboratory-Confirmed Influenza

Woody Sorey, BA[1]; Elizabeth M. Krantz, MS[2]; Jessica Morris, MPH[3]; John Klaassen, BA[4]; Ania Sweet, PharmD, BCOP[5]; Frank Tverdek, PharmD[3]; Steven A. Pergam, MD, MPH[6]; Catherine Liu, MD[6]; [1]University of Washington School of Medicine, Fred Hutchinson Cancer Research Center, Seattle, Washington; [2]Fred Hutch Cancer Research Center, Seattle, Washington; [3]Fred Hutchinson Cancer Research Center, Seattle, Washington; [4]Seattle Cancer Care Alliance, Seattle, Washington; [5]Seattle Cancer Care Alliance, University of Washington, Fred Hutch Cancer Research Center, Sammamish, Washington; [6]Fred Hutchinson Cancer Research Center; University of Washington, Seattle, WA

Session: P-68. Respiratory Infections - Viral

Background. Cancer patients are at high risk for serious complications due to influenza. Early treatment with neuraminidase inhibitors (NAIs) is recommended for high-risk patients with suspected or documented influenza. Limited data exist on timing of presentation to care and ambulatory management of cancer patients with influenza. We sought to characterize antimicrobial prescribing and outcomes among patients with influenza at a large cancer center.

Methods. We selected consecutive patients seen in the ambulatory cancer clinic with laboratory confirmed influenza between January 1, 2016 and December 31, 2018 for chart review. A lab-developed multiplex PCR assay was used with a turnaround time of about 24 hours. We obtained demographics, symptoms at first clinic encounter (day 0), viral testing, NAI and antibiotic prescribing, and clinical outcomes.

Results. Of 138 charts reviewed, 133 (96%) were eligible for analysis. 109 (82%) had an underlying hematologic malignancy. 84 (63%) tested positive for influenza A and 49 for influenza B. 58 (44%) presented to care within 48 hours of symptom onset (F1). The most commonly reported symptoms were cough (83%), fever (41%), and rhinorrhea (40%) (F2). 110 (83%) were prescribed oseltamivir, with 24 (22%) receiving empiric therapy on day 0, and 63 (57%) prescribed on day 1 (F3). Among 109 patients with known symptom onset date, 34 (31%) were prescribed oseltamivir within 48 hours of symptom onset. 23 (17.3%) were prescribed antibiotics, 17 (74%) on day 0 (F3). Levofloxacin (26%), azithromycin (21%) and vancomycin (18%) were most commonly prescribed. Nine (6.8%) patients progressed to lower respiratory tract infection, 1 complicated by bacterial pneumonia. There were 11 (8.3%) influenza-related hospitalizations, 1 (0.7%) ICU admission, and no influenza-related deaths.

Figure 1. Time From Symptom Onset to Date of First Clinical Encounter

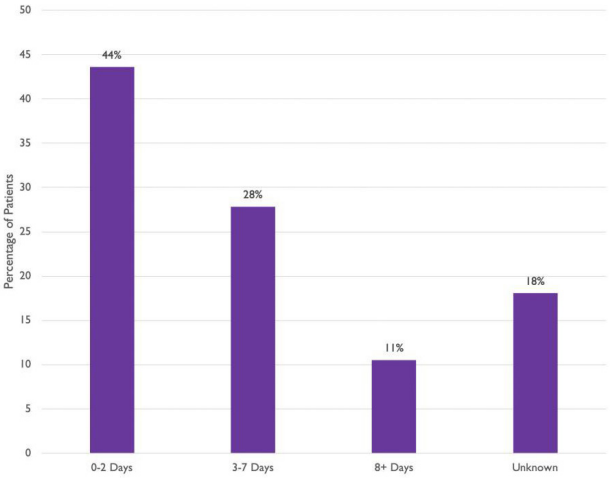


Figure 2. Symptoms Reported at First Clinical Encounter

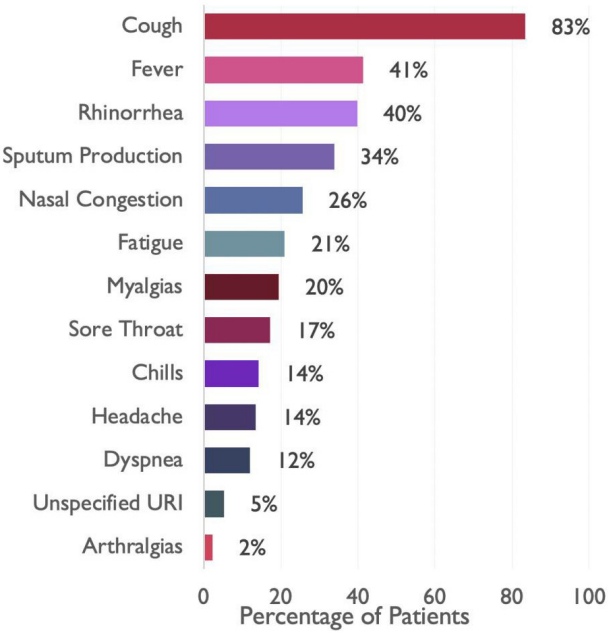
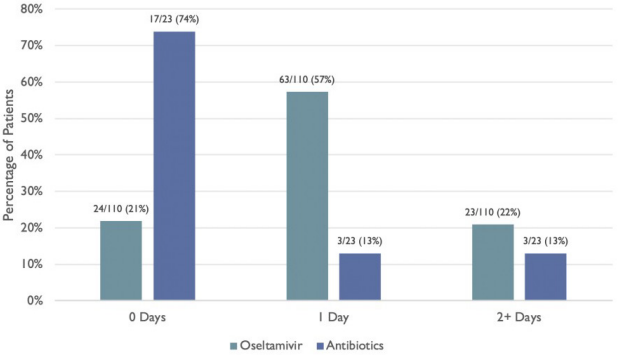


Figure 3. Time from First Clinical Encounter to Oseltamivir and Antibiotic Prescription



Conclusion: NAIs were frequently prescribed among cancer patients, but less than a third received treatment within 48 hours of symptom onset. Most were prescribed NAIs only after test results were available, while antibiotics were prescribed empirically. Delayed presentation to care is an obstacle to early NAI use; patient and provider education along with rapid diagnostics are needed to improve early NAI use among cancer patients with influenza.

Disclosures. **Steven A. Pergam, MD, MPH**, **Chimerix, Inc** (Scientific Research Study Investigator)**Global Life Technologies, Inc.** (Research Grant or Support)**Merck & Co.** (Scientific Research Study Investigator)**Sanofi-Aventis** (Other Financial or Material Support, Participate in clinical trial sponsored by NIAID (U01-AI132004); vaccines for this trial are provided by Sanofi-Aventis)

1506. Burden of Respiratory Syncytial Virus (RSV) and Other Lower Respiratory Tract Viral Infections During the First Two Years of Life: a Prospective Study

Shabir A. Madhi, MBBCH, FCPaeds (SA), MMed (Paeds, Wits), PhD[1]; Ana Ceballos, MD[2]; Jo Ann Colas, MSc[3]; Luis Cousin, MD[4]; Ulises D'Andrea, MD[2]; Ilse Dieussaert, IR[5]; Joseph B. Domachowske, MD[6]; Janet A. Englund, MD[7]; Sanjay Gandhi, MD[5]; Gerco Haars, PhD[5]; Mélanie Hercor, PhD[8]; Magali de Heusch, PhD[8]; Lisa Jose, MBchb[9]; Joanne M. Langley, MD[10]; Amanda Leach, MRCPCH[5]; Peter Silas, MD[11]; Jamaree Teeratakulpisarn, MD[12]; Timo Vesikari, MD, PhD[13]; Sonia K. Stoszek, PhD[5]; [1]University of the Witwatersrand, Johannesburg, South Africa, Johannesburg, Gauteng, South Africa; [2]Instituto Medico Rio Cuarto, Rio Cuarto, Cordoba, Argentina; [3]Keyrus Life Science on behalf of GSK, Rockville, MD, United States, Rockville, Maryland; [4]Tecnologia en Investigación, San Pedro Sula, Cortes, Honduras; [5]GSK, Rockville, MD; [6]SUNY Upstate Medical University, Syracuse, NY, United States, Syracuse, New York; [7]Seattle Children's Hospital/Univ. of Washington, Seattle, Washington; [8]GSK, Wavre, Belgium, Wavre, Brabant Wallon, Belgium; [9]Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, Gauteng, South Africa; [10]Canadian Center for Vaccinology, Dalhousie University, IWK Health Centre and Nova Scotia Health Authority, Halifax, NS, Canada, Halifax, Nova Scotia, Canada; [11]Wee Care Pediatrics, Syracuse, UT; [12]Khon Kaen University, Khon Kaen, Khon Kaen, Thailand; [13]Formerly: University of Tampere (currently: independent consultant), Tampere, Finland, Tampere, Pirkanmaa, Finland

Session: P-68. Respiratory Infections - Viral

Background. Lower respiratory tract infections (LRTIs) are a leading cause of pediatric morbidity and mortality worldwide, with ~650,000 deaths recorded in < 5-year-olds in 2016. Cross-sectional studies on hospitalized LRTIs are available, but longitudinal studies on the total burden of viral LRTIs are scarce. This study (NCT01995175) prospectively collected incident RSV and other viral LRTIs in a multinational cohort.

Methods. From 2013 to 2017, infants in 8 countries were enrolled at birth and followed for LRTIs up to 2 years of age. Infants with suspected LRTIs were clinically examined and swabbed. Nasal swab samples were tested using quantitative real-time PCR for RSV and multiplex PCR panel for 16 other respiratory viruses/subtypes; bacterial culture was not performed. LRTI and severe LRTI episodes were defined per 2015 WHO LRTI case definitions. Viruses detected from nasal swabs collected from participants with WHO-defined LRTI and severe LRTI episodes are reported.

Results. The 2401 infants followed experienced 1012 LRTI episodes; 259 of these were severe LRTIs. At least 1 virus was detected from 909 (90%) and 235 (91%) LRTI and severe LRTI episodes, respectively. Enteroviruses/Rhinoviruses (EV/RV, 49%) were detected most frequently in samples collected from LRTI episodes, followed by RSV (22%), parainfluenza (PIV, 14%), human metapneumovirus (hMPV, 8%) and seasonal coronavirus (CoV, 6%). RSV was detected in 39% of samples from LRTI episodes in < 3-month-olds and in 18% of 1-year-olds (Table 1). In a similar trend, RSV was detected in 47% of samples from severe LRTI episodes in < 3-month-olds and in 21% of 1-year-olds (Table 2). Co-infection with another virus was common in CoV-positive samples (67%), while most samples positive for RSV (71%), hMPV (70%), EV/RV (67%) and PIV (58%) had no other virus detected.

Table 1. Occurrence of laboratory confirmed respiratory viral infections by viral pathogens identified in nasal swab samples from WHO-defined LRTI episodes

		Age group				
		0–2 months N=111/110	3–5 months N=211/210	6–11 months N=277/276	12–23 months N=418/416	0–23 months N=1017/1012*
Respiratory virus, n (%)						
Enterovirus/Rhinovirus		**47 (42.3)**	**123 (58.3)**	**123 (44.4)**	**204 (48.8)**	**497 (48.9)**
RSV		**43 (38.7)**	**45 (21.3)**	**64 (23.1)**	**74 (17.7)**	**226 (22.2)**
Strain	A	13 (11.7)	11 (5.2)	19 (6.9)	51 (12.2)	94 (9.2)
	B	30 (27.0)	34 (16.1)	45 (16.2)	23 (5.5)	132 (13.0)
Any Parainfluenza		**10 (9.0)**	**39 (18.5)**	**34 (12.3)**	**61 (14.6)**	**144 (14.2)**
Type	1	0 (0.0)	1 (0.5)	6 (2.2)	10 (2.4)	17 (1.7)
	2	0 (0.0)	3 (1.4)	0 (0.0)	3 (0.7)	6 (0.6)
	3	7 (6.3)	26 (12.3)	19 (6.9)	33 (7.9)	85 (8.4)
	4	3 (2.7)	9 (4.3)	9 (3.2)	16 (3.8)	37 (3.6)
Human metapneumovirus		**2 (1.8)**	**10 (4.7)**	**27 (9.7)**	**41 (9.8)**	**80 (7.9)**
Any Coronavirus		**9 (8.1)**	**16 (7.6)**	**18 (6.5)**	**21 (5.0)**	**64 (6.3)**
Strain	229E	4 (3.6)	1 (0.5)	1 (0.4)	3 (0.7)	9 (0.9)
	OC43	4 (3.6)	6 (2.8)	13 (4.7)	11 (2.6)	34 (3.3)
	NL63	1 (0.9)	7 (3.3)	0 (0.0)	4 (1.0)	12 (1.2)
	HKU1	0 (0.0)	2 (0.9)	4 (1.4)	3 (0.7)	9 (0.9)
Adenovirus		**1 (0.9)**	**5 (2.4)**	**14 (5.1)**	**29 (6.9)**	**49 (4.8)**
Any Influenza		**3 (2.7)**	**6 (2.8)**	**12 (4.3)**	**22 (5.3)**	**43 (4.2)**
Type	A	3 (2.7)	4 (1.9)	10 (3.6)	15 (3.6)	32 (3.1)
	B	0 (0.0)	2 (0.9)	2 (0.7)	7 (1.7)	11 (1.1)
Bocavirus		**1 (0.9)**	**7 (3.3)**	**9 (3.2)**	**15 (3.6)**	**32 (3.1)**

Per-protocol set. LRTI, lower respiratory tract infection defined using the 2015 WHO case definition (Modjarrad et al 2016, doi: 10.1016/j.vaccine.2015.05.093); **N**, number of nasal swab samples collected in each age group/number of episodes in each age category; **n (%)**, number (percentage) of nasal swab samples positive for a given viral infection; **RSV**, respiratory syncytial virus. *912 nasal swab samples from 909 episodes had one or more laboratory confirmed viral pathogens. **Note:** data from multiple sites in Argentina, Bangladesh, Canada, Finland, Honduras, South Africa, Thailand and United States.

Table 2. Occurrence of laboratory confirmed respiratory viral infections by viral pathogens identified in nasal swab samples from WHO-defined severe LRTI episodes

		Age group				
		0–2 months N=45/45	3–5 months N=68/67	6–11 months N=62/62	12–23 months N=85/85	0–23 months N=260/259*
Respiratory virus, n (%)						
Enterovirus/Rhinovirus		**19 (42.2)**	**38 (55.9)**	**28 (45.2)**	**42 (49.4)**	**127 (48.8)**
RSV		**21 (46.7)**	**18 (26.5)**	**16 (25.8)**	**18 (21.2)**	**73 (28.1)**
Strain	A	5 (11.1)	4 (5.9)	5 (8.1)	13 (15.3)	27 (10.4)
	B	16 (35.6)	14 (20.6)	11 (17.7)	5 (5.9)	46 (17.7)
Any Parainfluenza		**4 (8.9)**	**15 (22.1)**	**3 (4.8)**	**8 (9.4)**	**30 (11.5)**
Type	1	0 (0.0)	1 (1.5)	1 (1.6)	4 (4.7)	6 (2.3)
	2	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	3	4 (8.9)	12 (17.6)	2 (3.2)	1 (1.2)	19 (7.3)
	4	0 (0.0)	2 (2.9)	0 (0.0)	4 (4.7)	6 (2.3)
Human metapneumovirus		**0 (0.0)**	**2 (2.9)**	**8 (12.9)**	**9 (10.6)**	**19 (7.3)**
Any Coronavirus		**2 (4.4)**	**4 (5.9)**	**5 (8.1)**	**3 (3.5)**	**14 (5.4)**
Strain	229E	1 (2.2)	0 (0.0)	0 (0.0)	1 (1.2)	2 (0.8)
	OC43	0 (0.0)	0 (0.0)	3 (4.8)	2 (2.4)	5 (1.9)
	NL63	1 (2.2)	4 (5.9)	0 (0.0)	0 (0.0)	5 (1.9)
	HKU1	0 (0.0)	0 (0.0)	2 (3.2)	0 (0.0)	2 (0.8)
Adenovirus		**0 (0.0)**	**2 (2.9)**	**4 (6.5)**	**6 (7.1)**	**12 (4.6)**
Bocavirus		**0 (0.0)**	**3 (4.4)**	**4 (6.5)**	**3 (3.5)**	**10 (3.8)**
Any Influenza		**0 (0.0)**	**2 (2.9)**	**2 (3.2)**	**4 (4.7)**	**8 (3.1)**
Type	A	0 (0.0)	1 (1.5)	2 (3.2)	4 (4.7)	7 (2.7)
	B	0 (0.0)	1 (1.5)	0 (0.0)	0 (0.0)	1 (0.4)

Per-protocol set. severe LRTI, severe lower respiratory tract infection defined using the 2015 WHO case definition (Modjarrad et. al. 2016; doi: 10.1016/j.vaccine.2015.05.093); **N**, number of nasal swab samples collected/number of episodes in each age category; **n (%)**, number (percentage) of nasal swab samples positive for a given viral infection; **RSV**, respiratory syncytial virus; *185 nasal swab samples from 185 episodes had one or more laboratory confirmed viral pathogens. **Note:** data from multiple sites in Argentina, Bangladesh, Canada, Finland, Honduras, South Africa, Thailand and United States.

Conclusion: Respiratory viruses are detected in the majority of LRTIs during the first 2 years of life. RSV likely accounts for much of this overall LRTI burden. Our results suggest that RSV most strongly impacted the very young; it was the most commonly detected virus in severe LRTIs in infants aged < 3 months. RSV was also persistently detected at high levels in samples from LRTIs (22%) and severe LRTIs (28%) in children up to 2 years old.

Funding. GlaxoSmithKline Biologicals SA

Disclosures. Ana Ceballos, MD, GSK group of companies (Scientific Research Study Investigator) Jo Ann Colas, MSc, GSK group of companies (Consultant) Luis Cousin, MD, Tecnología en Investigación (Scientific Research Study Investigator) Ilse Dieussaert, IR, GSK group of companies (Employee, Shareholder) Joseph B. Domachowske, MD, Astra Zeneca (Other Financial or Material Support, Grant/Research Support paid to my Institution on my behalf for sponsored human clinical trial activities)GSK group of companies (Other Financial or Material Support, Grant/Research Support paid to my Institution on my behalf for sponsored human clinical trial activities)Merck (Other Financial or Material Support, Grant/Research Support paid to my Institution on my behalf for sponsored human clinical trial activities) Janet A. Englund, MD, AstraZeneca (Scientific Research Study Investigator)GSK group of companies (Scientific Research Study Investigator)Meissa vaccines (Consultant) Merck (Scientific Research Study Investigator)Sanofi Pasteur (Consultant) Sanjay Gandhi, MD, GSK group of companies (Employee) Mélanie Hercor, PhD, GSK group of companies (Employee) Magali de Heusch, PhD, GSK group of companies (Employee) Joanne M. Langley, MD, GSK group of companies (Research Grant or Support)Immunivaccines Inc (Scientific Research Study Investigator, Research Grant or Support)Janssen (Research Grant or Support)Pfizer (Research Grant or Support) Symvivo (Scientific Research Study Investigator, Research Grant or Support)VBI Vaccines (Research Grant or Support) Amanda Leach, MRCPCH, GSK group of companies (Employee) Timo Vesikari, MD, PhD, Denka (Consultant) Sonia K. Stoszek, PhD, GSK group of companies (Employee, Shareholder)

1507. Clinical Characteristics of Common Respiratory Viruses Detected in Infants Across Different Clinical Settings

Zaid Haddadin, MD[1]; Danielle A. Rankin, MPH, CIC[1]; loren lipworth, ScD[2]; Jon Fryzek, PhD, MPH[3]; Mina Suh, MPH, International Health[4]; Donald S. Shepard, PhD[5]; Rendie McHenry, MS[1]; Rebekkah Varjabedian, BS[1]; Kailee N. Fernandez, BS[1]; Christopher Nelson, PhD, Epidemiology[6]; Natasha B. Halasa, MD, MPH[7]; [1]Vanderbilt University Medical Center; Division of Pediatric Infectious Diseases, Nashville, Tennessee; [2]Division of Epidemiology - 104370, Nashville, Tennessee; [3]EpidStrategies, A Division of ToxStrategies, Inc., Rockville, MD; [4]Epidstrategies, Mission Viejo, California; [5]Brandeis University, Waltham, Massachusetts; [6]Sanofi, Swiftwater, Pennsylvania; [7]Vanderbilt University Medical Center, Nashville, Tennessee

Session: P-68. Respiratory Infections - Viral

Background. Viral acute respiratory infections (ARI) continues to be a significant cause of healthcare visits in young children. We evaluated the clinical presentation and disease severity of common respiratory viruses associated with medically attended ARI in infants.

Methods. We conducted a prospective viral surveillance study in Davidson County, TN. Infants under one year with fever and/or respiratory symptoms were enrolled from the outpatient (OP), emergency department (ED), or inpatient (IP) settings from 12/16/2019 through 4/30/2020. Nasal swabs were collected and tested for common viral pathogens using Luminex® NxTAG Respiratory Pathogen Panel. Demographic and clinical characteristics were collected through parent/guardian interviews and medical chart abstractions.

Results. In total, 364 participants were enrolled, and 361 (99%) had nasal swabs collected and tested. Overall, mean age was 6±3.3 months, 50% were female, 45% White, and 27% Hispanic. Of the 295 (82%) virus-positive specimens; the three most