

Results. A total of 78 recruits participated in the study. The participants were male and the mean age was 21 years (SD 4.9). In the first two weeks of training, nine recruits reported to outpatient clinics for their ILI, resulting in an attack rate of 12%. Fifty-five recruits returned symptom diary cards with at least 13 days of records between visit 1 and visit 2. Among them, four trainees visited clinics for ILI while additional 14 trainees reported at least one day of ILI without seeking healthcare. The proportion of patients not seeking care was 78%. The attack rate of self-reported ILI (to health clinics or on symptom cards) was 33% (18/55). The self-reported ILI participants reported a median of 2 days of having ILI (range: 1–7 days).

Conclusion. Our data showed that the majority of trainees reporting ILI did not seek healthcare. The attack rate based on clinic attendance largely underestimated the ILI burden. Understanding reasons and obstacles of trainees not seeking care would be crucial in infection control and reduction of ILI transmission among basic training recruits who are at high risk of ILI.

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2500. Incidence of Herpes Zoster in the Pre- and Post-Vaccine Era: Do Trends Differ Between Blacks And Whites?

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Session: 255. Virology Potpourri
Saturday, October 6, 2018: 12:30 PM

Background. Herpes zoster (HZ) incidence in blacks is 25%–65% lower than in whites in the United States. Since 2007 and the widespread introduction of Zostavax (ZVL), studies report plateauing or decreasing HZ incidence in the United States among persons ≥60 years. We examined HZ incidence and ZVL coverage trends by race among Medicare beneficiaries, in the pre- and post-vaccine era.

Methods. We used administrative health claims from a 5% sample of Medicare beneficiaries ≥65 years. We defined incident cases as HZ in the first diagnostic position, with no HZ code in the previous year, among beneficiaries enrolled in Part A and B, from 1992 to 2015. We calculated incidence of first HZ episode by dividing the number of cases by the total number of person-years (p-y). A case was a censoring event. We used Poisson regression to compare HZ incidence by race before and after 2007. We calculated vaccine coverage by dividing the total number of persons with ZVL in Medicare Part D by the number of eligible enrollees.

Results. We identified 266,745 first HZ episodes. Prior to 2007, HZ incidence increased among both blacks and whites. Although incidence was double in whites vs. blacks (10.3 vs. 5.0 cases/1000 p-y), the rate of increase was similar ($P = 0.75$). From introduction of ZVL to 2015, HZ incidence decreased 1.8%/year in whites and did not change significantly in blacks ($P < 0.001$) (figure). By 2015, ZVL uptake in Medicare among blacks was less than half that among whites (7.3% vs. 19.9%).

Conclusion. Incidence of HZ increased at a similar rate for black and white Medicare beneficiaries in the pre-vaccine era. In the post-vaccine era, incidence has decreased among whites and plateaued among blacks. Though the reasons for racial difference and temporal changes in HZ incidence remain unknown, ecologic association suggests higher vaccination rates may contribute to steeper HZ declines among whites in the post vaccine era.

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2501. Impact of Influenza A and B Infection on Stem Cell Transplant Patients During the 2017–2018 Season at a Single Center

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Session: 255. Virology Potpourri
Saturday, October 6, 2018: 12:30 PM

Background. Seasonal influenza causes significant morbidity and mortality on HSCT recipient. The 2017–2018 influenza has been characterized in the United States by prolonged high rates of both influenza A (IAV) and B (IBV) and low vaccine effectiveness. The aim of this study was to assess the impact of both IAV and IBV during 2017–2018 influenza season on a cohort of stem cell transplant (SCT) recipients at Weill Cornell- NYP.

Methods. We reviewed charts of HSCT recipients that were diagnosed with influenza by PCR on nasopharyngeal swabs. Demographics, clinical and microbiological data, and outcomes were collected. The study was approved by Weill Cornell Institutional review board.

Results. From September 2017 to March 2018, 30 stem cell transplant recipient at NYP were diagnosed with influenza. IAV cases peaked in January (11 cases) while IBV infected-patients were equally distributed from December to March. Infected subject were more likely to be male ($n = 20, 66.6\%$) with mean age of 57 ± 12 (IAV) vs. 59 ± 11

(IBV). Nine patients had received auto SCT and 21 patient allo SCT. Most common symptoms were cough (present in all patients), fever (28/30), nausea, dyspnea. Patient received oseltamivir (for 5 or 10 days) in 28/30 cases, with one patient developing resistance under treatment. Interestingly both IAV and IBV caused lower respiratory tract infection (LRTI, 7 cases) with severe pneumonia (IAV 1 cases, IBV 2 cases) and intubation. In two severe cases IV was detected in the BAL. 13 subjects (56%) with a URTI and 4 (43%) subjects with LRTI had not received the influenza vaccine for the season. Prolonged shedding of influenza on oseltamivir treatment was documented in 7 patients.

Conclusion. Both IAV and IBV are serious threat in SCT population. Vaccination and oseltamivir are useful tools. Resistance testing should be considered in subjects with prolonged disease.

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2502. Host Susceptibility to Andes Hantavirus Infection Associates to a Single Nucleotide Polymorphism at the $\alpha V\beta 3$ Integrin

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Session: 255. Virology Potpourri
Saturday, October 6, 2018: 12:30 PM

Background. ANDV is etiologic agent of hantavirus cardiopulmonary syndrome (HCPS) in Chile. Transmission occurs mainly by exposure to aerosolized excretes of infected rodents, person-to-person transmission has also been reported. ANDV infected endothelial cell through $\alpha V\beta 3$ integrin at plexin-semaphorin-integrin (PSI) domain. *In vitro* assays establish that the change from leucine to proline, at residues 33 in PSI-domain inhibits ANDV recognition of integrin. Here we assessed the risk that represents a polymorphism leucine to proline (L33P) and the association to susceptibility to ANDV.

Methods. For risk assessment, 74 cases and 105 controls (exposed but not infected) were genotyped by Taqman assay, epidemiological and demographic data were recorded. We also evaluated SNP distribution at general population, infected population (serum collection) and 11 prospectively diagnosed ANDV cases. A regression logistic model was used to assess environmental or person to person risks factors of hantavirus infection either in presence or absence of the “susceptible” or “protective” genotypes.

Results. In cases and controls the susceptible (TT) genotype (Leucine) was distributed in an 89.2 and 60%, respectively (Figure 1). The protective genotype (CC) was absent among cases but present at 11.4% in exposed controls. We estimated the Odds ratio (OR), through a logistic model, first using only previously described risk activities and after adding the genotype TT; the OR increased from 6.2 to 12.6. Cases and control at same exposure (access to abandoned place) showed that controls have a 57% of TT genotype, meanwhile in cases was 91%, with an OR of 7.3. For a second common exposure activities (handle woods) the controls had a 59.4% of TT genotype, meanwhile for cases 85%. For general and infected population both did not show statistical differences in allele distribution, and we detected a 1.7% of CC genotype in the infected population (Figure 2). We did not detected CC genotypes in the eleven prospective ANDV cases.

Conclusion. There was association between this particular SNP and infection susceptibility to ANDV. We highlight the relevance of genetic background in host-virus interaction. Nevertheless, other factors such as innate immune system or viral variability must be explored to fully understand the disease pathogenesis.

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2503. Assessment of State-Level Influenza Season Severity—Utah, 2017–2018

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Session: 255. Virology Potpourri
Saturday, October 6, 2018: 12:30 PM

Background. Influenza surveillance provides national indicators of influenza season severity in the United States. Given the variability in influenza activity from season to season and geographically, real-time state-specific estimates of seasonal influenza severity may help states tailor their public health communications and resource allocation during influenza seasons. Nationally, the 2017–2018 season was categorized as high severity; we developed disease severity thresholds to characterize the severity of the influenza season in Utah.

Methods. We applied the Moving Epidemic Method for a rapid mid-season assessment of weekly influenza season severity to 3 priority Utah indicators with at least 5 seasons of data: percent of outpatient visits for influenza-like illness, state-wide rate of reported influenza-associated hospitalizations, and percent positive influenza tests from the National Respiratory and Enteric Virus Surveillance System. This method calculates intensity thresholds (ITs) by determining the geometric mean and standard deviation of the 30 highest weekly values, distributed evenly across included seasons, and calculating one-sided confidence intervals. We established 3 ITs that corresponded to a 50% (IT₅₀), 10% (IT₉₀), and 2% (IT₉₈) chance of exceedance during a given influenza season. For each surveillance indicator, we graphed the weekly data against the calculated severity thresholds.

Results. We preliminarily categorized the 2017–2018 season as well as the 2014–2015 season, as high severity because ≥ 2 priority indicators peaked above their IT₉₀ (Figures 1–3). All other seasons in Utah (beginning in 2012–2013) were categorized as moderate severity because ≥ 2 indicators peaked between IT₅₀ and IT₉₀.

Conclusion. The Utah seasonal severity assessment matched the national level assessment for all seasons. Understanding state-specific severity assessments during and after a season may help to inform states' influenza preparedness activities.

Figure 1.

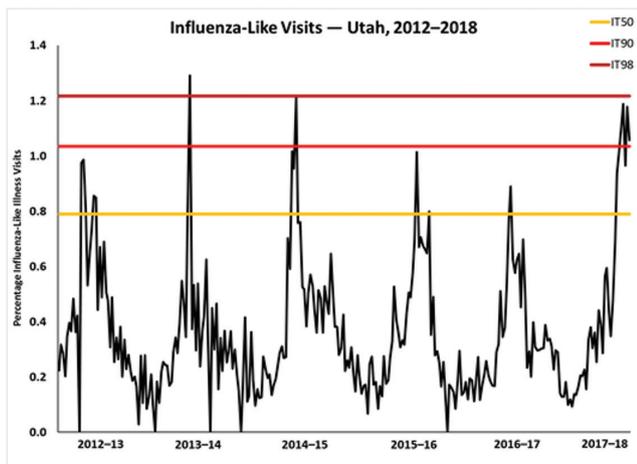


Figure 2.

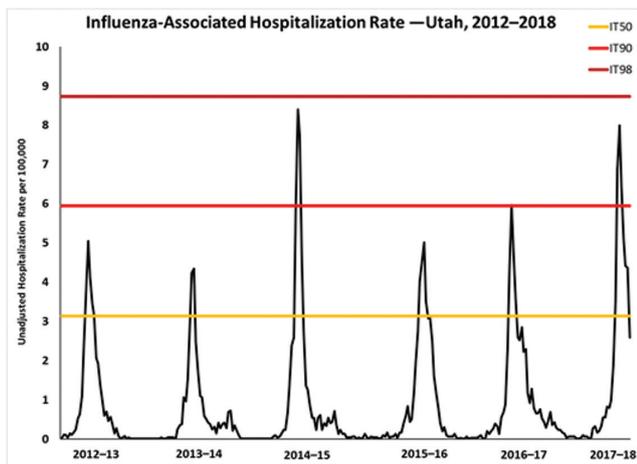
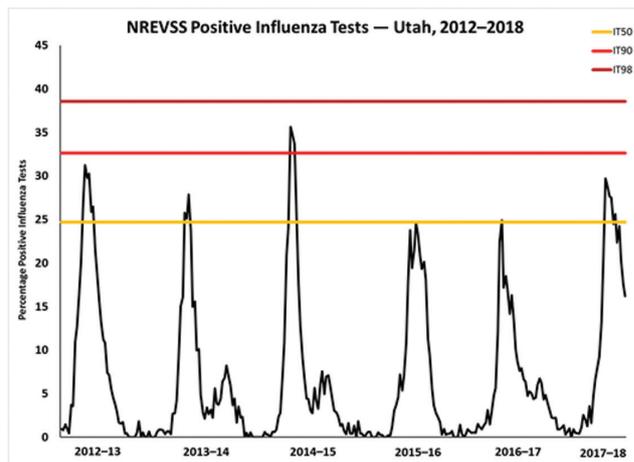


Figure 3.



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2504. Influenza Surveillance and Outbreaks in the US Department of Veterans Affairs (VA): 2017–2018 Season

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Session: 255. Virology Potpourri
Saturday, October 6, 2018: 12:30 PM

Background. VA conducts yearly surveillance for seasonal influenza. VA's large elderly population is at higher risk for influenza complications, including hospitalization and death. Herein we summarize 2017–2018 national influenza activity, outbreak and vaccination data for VA.

Methods. Hospitalizations, outpatient visits, influenza testing, and antivirals were obtained from VA data sources (October 1, 2017–March 31, 2018) and compared with prior seasons. Vaccines were captured from August 1, 2017 and vaccination percentage calculated based on VA users for each fiscal year. Outbreak data were collected from VA Issue Briefs and email survey of facility Infection Preventionists.

Results. Surveillance metrics for 6 seasons are presented (table). In 2017–2018, high-dose (HD) vaccine increased to 20% of total vaccine given. Outpatient visits, hospitalizations, confirmed cases and antiviral prescriptions were more than double that of previous seasons. 46 distinct outbreaks at 35 different VA hospitals were also reported this season. Among 31,611 laboratory-confirmed influenza (LCI) cases, Veterans with vaccination >14 days prior to LCI were significantly more likely to have an influenza-related hospitalization than those with no documented vaccination (782, 29% vs. 5,888, 21%, $P < 0.01$) and were less likely to have received HD vaccine compared with the overall VA patient population (375; 14% vs. 365,357; 20%, $P < 0.01$) (figure).

Conclusion. The 2017–18 season was the most severe since VA surveillance was initiated in 2009. HD vaccine use increased over the seasons evaluated, but overall vaccination levels were stable. Nearly 90% of those with LCI had no VA-documented vaccination this season, although some may have received vaccine outside VA. Overall hospitalization rate for Veterans with LCI was high (22%). Vaccination did not reduce the likelihood of being hospitalized with influenza; however, HD vaccine may have afforded some additional protection compared with standard dose.

Table. VA Influenza Surveillance Measures, 2012–2013 through 2017–2018 Seasons.

VA Influenza Metrics	2012-13 N (%)	2013-14 N (%)	2014-15 N (%)	2015-16 N (%)	2016-17 N (%)	2017-18 N (%)
Total Vaccinations*	1,985,957 (33)	1,964,796 (32)	1,820,470 (29)	1,774,795 (28)	1,757,907 (28)	1,825,598 (29)
High-Dose Vaccine	39,474 (2)	47,234 (2)	101,432 (6)	176,932 (10)	278,134 (16)	365,732 (20)
Outpatient Visits	13,406	7,129	12,101	8,790	15,673	36,999
Hospitalizations	2,509	2,442	4,673	2,667	4,415	8,379
Deaths*	72 (3)	73 (3)	139 (3)	79 (3)	101 (2)	279 (3)
Influenza Tests	38,876	44,746	70,836	62,058	93,108	135,153
Total Positive	6,361 (16)	6,095 (14)	11,506 (16)	6,389 (10)	13,739 (15)	31,611 (23)
Influenza A	4,841 (76)	4,983 (82)	9,058 (79)	4,428 (69)	10,330 (75)	21,924 (69)
Influenza B	1,448 (23)	1,060 (17)	2,355 (20)	1,888 (30)	3,352 (24)	9,575 (30)
A&B/Not Specified	72 (1)	52 (1)	93 (1)	73 (1)	57 (<1)	112 (<1)
Total Antivirals	21,117	16,753	32,826	16,983	32,462	65,069
Inpatient	6,207	4,335	7,539	4,073	8,874	14,692
Outpatient	14,910	12,418	25,287	12,910	23,588	50,377

*Percentage calculated based on the total number of VA users reported each fiscal year (VSSC Enrollment Cube).

*Deaths during an influenza-coded hospitalization (record reviews were not performed to assess whether influenza was documented as a principal or contributing cause of death).