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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% (IT1), 10% (IT2), and 2% (IT3) 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 IT1 (Figures 1–3). All other seasons in Utah (beginning in 2012–2013) were categorized as moderate severity because ≥2 indicators peaked between IT1 and IT2.

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.

Disclosures. All authors: No reported disclosures.

2504. Influenza Surveillance and Outbreaks in the US Department of Veterans Affairs (VA): 2017–2018 Season
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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 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 | 2013–14 | 2014–15 | 2015–16 | 2016–17 | 2017–18 |
|----------------------|---------|---------|---------|---------|---------|---------|
| Total Vaccinationsa | 1,905,557 (19) | 1,964,796 (18) | 1,904,470 (18) | 1,774,755 (18) | 1,757,657 (18) | 1,823,199 (18) |
| High-Dose Vaccine | 19,474 (2) | 47,274 (2) | 101,452 (8) | 176,932 (10) | 273,134 (10) | 369,752 (10) |
| Outpatient Visits | 12,406 | 7,129 | 11,231 | 7,970 | 10,075 | 8,379 |
| Hospitalizations | 2,509 | 2,442 | 4,075 | 2,657 | 2,435 | 1,829 |
| Deathsb | 72 (2) | 73 (2) | 139 (1) | 79 (1) | 105 (2) | 279 (2) |
| Influenza Tests | 36,879 | 44,789 | 70,888 | 62,656 | 73,206 | 105,253 |
| Total Positive | 6,982 (18) | 6,095 (14) | 11,500 (16) | 8,395 (10) | 10,739 (15) | 11,613 (23) |
| Influenza A | 6,841 (17) | 5,965 (13) | 9,018 (17) | 5,420 (9) | 10,032 (17) | 11,914 (19) |
| Influenza B | 1,448 (23) | 1,080 (17) | 2,353 (20) | 1,888 (16) | 1,352 (24) | 9,379 (20) |
| Added/Not Specified | 72 (2) | 52 (1) | 59 (1) | 76 (1) | 57 (1) | 112 (2) |
| Total Antivirals | 23,137 | 18,770 | 52,269 | 16,551 | 52,462 | 63,699 |
| Inpatient | 6,207 | 4,335 | 7,509 | 4,073 | 8,874 | 14,692 |
| Outpatient | 16,930 | 14,435 | 45,760 | 12,478 | 43,588 | 58,307 |

aPercentage calculated based on the total number of VA users reported each fiscal year (VSC Enrollment Cubes).

bDeaths during an influenza-coded hospitalization (record reviews were not performed to assess whether influenza was documented as a principal or contributing cause of death).
3,150 (18.6%) 
VA Flu Vaccine Recorded 
Age: 44 (70%), 45-64 (1009, 32.5%), 65 (393, 19.6%) 
Flu Hospitalization: (2,108, 56.4%)

502 (1.6%) 
Vaccine received after Flu + Test Date 
Flu Hospitalization: (170, 26%)

149 (0.5%) 
Vaccine received 14 days prior to Flu + Test Date 
Flu Hospitalization: (50, 37.9%)

2,094 (1.6%) 
Vaccine received <14 days prior to Flu + Test Date 
Age: 44 (199, 76.4%), 45-64 (854, 33.9%), 65 (1,667, 62.9%)

3,571 Flu A 
10-80% of 21,032 Flu + Test Results 
Vaccine: High Dose (1396, 54%), Standard Dose (2654, 46%)

3,571 Flu B 
0-2.5% Flu B + Test Results 
Vaccine: High Dose (1396, 53%), Standard Dose (2654, 47%)

20 Flu A/ B not specified 
17% of 132 Flu A/ B Test Results 
Vaccine: High Dose (72, 11%), Standard Dose (37, 89%) 

Figure. Review of laboratory-confirmed influenza cases in VA, 2017-2018 Season.

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2505. A Novel Mobile Phone Application for Remote Research Data Collection is Effective in Monitoring Chronic Sequela of Acute Viral Infections
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Background. Although much is known about the presentation of acute viral infections such as dengue fever, the long-term sequelae has not been systematically studied. Anecdotal evidence suggests that many viral infections, particularly flavivirus infections, may have long-term sequelae. Prospective longitudinal studies to evaluate such chronic health outcomes, however, require subjects to comply with multiple follow-up clinic visits, making them costly to run and vulnerable to high dropout rates. Using acute dengue and other febrile illnesses (OFI) as test cases, we aimed to explore the utility of a mobile phone application to evaluate the long-term sequelae and self-reported health outcomes in a cohort of patients up to one year post infection.

Methods. We designed a Mobile phone Application for Information extraction in Dengue (MAIDEN) to study the long-term health outcomes of acute dengue compared with OFI. Demographic and clinical information was collected from the study participants at enrollment. Participants were sent a link via e-mail to download MAIDEN onto their mobile phone. Except for the day 1 visit, participants were not required to attend the site study in person, but instead used MAIDEN to remotely enter information on symptoms experienced at stipulated intervals.

Results. A total of 44 participants have been recruited to date. 4 participants had acute dengue infection and 40 had OFI. The overall study follow-up compliance rate was 89.2%. 23/44 patients have completed visits up till day 21. Of these 23 patients, 43 reported symptoms at day 7 and 39 at day 21. The table below shows the number of individual symptoms experienced by these participants.

| Dengue (n=4) | OFI (n=19) |
|-------------|----------|
| **Day 7** | **Day 21** | **Day 7** | **Day 21** |
| Lack of energy | 1 | 1 | 8 | 4 |
| Inability to concentrate | 1 | 0 | 4 | 3 |
| Memory impairment | 0 | 0 | 2 | 1 |
| Headache | 1 | 0 | 3 | 3 |
| Myalgia | 1 | 1 | 1 | 3 |
| Arthralgia | 2 | 0 | 1 | 3 |
| Anorexia | 1 | 0 | 1 | 2 |

Conclusion. Chronic symptoms continue to persist in a significant proportion of patients with acute viral illnesses. Mobile applications such as MAIDEN can serve as useful tools to support remote research data collection, making longitudinal follow-up of such patients feasible.

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2506. Reactivation of Latent Cytomegalovirus Infection Following Major Surgery: Risk Factors and Outcomes
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Background. Reactivation of latent cytomegalovirus infection can occur in nonimmunocompromised individuals during critical illness and may be associated with increased morbidity and mortality. However, few studies have focused on patients undergoing major surgery. Our aim was to explore risk factors for and outcomes following CMV reactivation in nonimmunocompromised post-operative patients.

Methods. We performed a retrospective case-control study of nonimmunocompromised patients with CMV reactivation following major surgery from 2004 to 2016. Cases included patients testing positive for CMV by viral load, viral culture or histopathology. Controls were matched to cases 2:1 by age, sex, type and year of surgery. Groups were compared using conditional logistic regression.

Results. 16 patients with CMV were matched to 32 controls. Median age was 65 (range 34–84) and 50% were male. The most common surgeries were abdominal (48%) and thoracic (25%). Median time from surgery to CMV diagnosis was 32 days (range 17–93). Patients had a range of clinical symptoms including fever (94%), headache (75%), bone marrow suppression (56%) and gastrointestinal symptoms (56%). All except one were treated with antiviral therapy. Despite having similar baseline Charlson co-morbidity scores, cases were more likely to return to surgery within 3 months (odds ratio, OR 6.31; 95% CI, 1.29–30.74), require renal replacement therapy (OR 18.54, 2.36–145.6), total parenteral nutrition (OR 3.30, 6.60–262.37) and corticosteroids (OR 18.78, 4.5–103.9). Length of stay was increased (median 51 vs 8 days, P = 0.005), infections were more common (OR 15.10, 1.89–120.8), and in-hospital mortality was significantly higher (38% vs. 0%, P < 0.01).

Conclusion. Reactivation of CMV occurs in nonimmunocompromised patients post-operatively and is associated with poor outcomes including other infections and mortality. Potential risk factors include prolonged length of stay, development of surgical complications, and prolonged use of corticosteroids. It is not clear from our study if CMV reactivation is a surrogate marker of severe illness and postoperative complications, or if CMV reactivation plays a causative role in the development of these adverse outcomes.

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2507. Active Norovirus Surveillance in Children Under 5 Years With Diarrhea Following Rotavirus Vaccine Introduction in Argentina
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Background. Acute diarrhea is one of the main causes of infant mortality. Argentina introduced massive rotavirus vaccination in 2015. This introduction in several countries, has changed the distribution of enteropathogens and has been described a decrease in the rotavirus prevalence at the expense of an increase in norovirus (NoV) activity. NoV is reported to be emerging as one of the main agents producing acute diarrhea in the community. In Argentina, there are few experiences estimating its prevalence in cases of acute diarrhea in children. The aim of this study was to analyze the role of NoV in outpatient children <5 years of age with acute diarrhea and their epidemiological pattern.

Methods. Prospective, cross-sectional study of outpatients <5 years attended for acute diarrhea in Children’s Hospital “R. Gutiérrez” between June 2017 and March 2018. Active epidemiological surveillance was performed with a specific case reporting form. Stool samples were collected and tested for NoV (RT-qPCR), clinical and epidemiological data were recorded.

Results. A total of 136 patients were included and 125 stools were processed. The median of age was 20 months (IQR: 12–31) and 59% were male; the most common symptom was fever and vomiting in 70% and 55%, respectively. A 55% had watery diarrhea and...