1.46, 95% CI 1.39–1.63, P < 0.0001), lower adjusted peak heart rate (OR 0.79, 95% CI 0.69–0.90, P = 0.0005), higher initial oxygen saturation (OR 1.07, 95% CI 1.03–1.12 P = 0.002) and lower adjusted respiratory rate (OR 0.74, 95% CI 0.64–0.87, P = 0.0002) were significant predictors for having PCR-confirmed influenza. However, this model had poor calibration and discriminatory ability.

**Conclusion.** Higher respiratory rate adjusted for age and lower initial oxygen saturation were significant predictors of hospitalization among young children with PCR-confirmed influenza, but were not reliable discriminators of having influenza infection.

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

### 2320. The Role of Ultraviolet Light, Atmospheric Ozone, and Humidity in Influenza Activity

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**Session:** 247. Clinical Virology/Viral Epidemiology

**Saturday, October 5, 2019: 12:15 PM**

**Background.** The interaction between influenza activity and environmental factors such as ultraviolet light index (UVI), atmospheric ozone (AO), and other related meteorological variables remains poorly understood. In the midst of climate change and increasingly poor performance of influenza vaccination, more information on influenza activity and its interaction with meteorological variables is critically needed.

**Methods.** Influenza A and B tests results by PCR from respiratory sources were collected from two large hospitals in Phoenix, AZ and Jacksonville, FL from January 1, 2014 to December 31, 2017. Publicly available meteorological data for each location was obtained from the National Oceanic and Atmospheric Administration. We excluded cases residing beyond 0.5° of longitude and latitude radius of the given meteorological data. A weekly index activity and maximum weekly values of meteorological data were matched, and performed a correlation and regression analysis.

**Results.** A total of 5,238 influenza tests were performed during the study period. The influenza index showed a statistically significant weekly positive correlation with maximum CSUVI (r = 0.14; P = 0.0227) and mean zenith (r = 0.17; P = 0.0047). An statistically significant, positive correlation was observed between influenza index and atmospheric ozone (r = 0.23; P = 0.0001).

Significant negative correlations were also observed with DFT, DPT, RH and H1 (r = −0.27, r = −0.39, r = −0.13, r = −0.33, respectively; P < 0.04). The influenza index showed significant interactions in a univariate linear regression (Table 1). A relationship between influenza index and dew point temperature was observed in a multivariate model (OR = 0.66; CI95% 0.44–0.97).

**Conclusion.** To the best of our knowledge, this is the first report showing a significant interactions between influenza index, UV1 and atmospheric ozone in two geographically distant locations. Further studies are needed to define the role of complex climatological patterns and influenza.

**Table 1. Multivariate linear regression of weekly influenza index and maximum weekly meteorological variables.**

| Variables                      | OR    | CI95%     | p-value |
|-------------------------------|-------|-----------|---------|
| Mean Zenith                   | 1.18  | 1.05 to 1.32 | 0.0047  |
| Clear sky UVI                 | 2.12  | 1.11 to 4.03 | 0.0227  |
| Cloudy sky UVI                | 0.78  | 0.40 to 1.52 | 0.4636  |
| Cloud transmission            | 0.30  | 0.06 to 1.61 | 0.1605  |
| Aerosol transmission          | 1.07  | 0.31 to 3.70 | 0.9112  |
| Atmospheric ozone             | 1.11  | 1.05 to 1.17 | 0.0001  |
| Hourly dry bulb temperature   | 0.72  | 0.62 to 0.82 | <0.0001 |
| Dew point temperature         | 0.64  | 0.56 to 0.73 | <0.0001 |
| Relative humidity             | 0.91  | 0.84 to 0.99 | 0.0362  |
| Heat Index                    | 0.67  | 0.58 to 0.77 | <0.0001 |

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

### 2321. FluMex: A New Clinical Severity Index in Mexican Hospitalized Patients with Influenza

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**Session:** 247. Clinical Virology/Viral Epidemiology

**Saturday, October 5, 2019: 12:15 PM**

**Background.** Influenza virus infection is frequently characterized by a complex clinical behavior and outcomes can be fatal. There are many published scoring methods aimed for pulmonary infections and sepsis severity nevertheless they lack adequate sensitivity and specificity in patients with Influenza.

**Methods.** From 2013 to 2018, hospitalized patients from five hospitals from the Christus Muguerza health group from Monterrey, Mexico who had a positive rapid influenza-test and/or positive PCR for Influenza virus were enrolled. Risk factors for severity and mortality were evaluated calculating odds ratio with a binary logistic regression model and were adjusted for other factors. The new index was then compared with pneumonia severity scores by assessing area under the curve (AUC), sensitivity and specificity.

**Results.** We analyzed data from 125 patients hospitalized with confirmed Influenza infection. Less than 1% had received the corresponding seasonal influenza vaccine. Type 2 diabetes (T2D) and hypertension (HT) were the most prevalent comorbidities. Odds ratios were significant for age > 65 years, body mass index (BMI) > 30, T2D, HT, pulsoximetry < 90%, respiratory rate > 22 per minute, altered mental status, blood urea nitrogen (BUN) > 19 mg/dL, elevated lactate dehydrogenase (LDH), and an abnormal chest X-ray. The FluMex score was applied to a control group of 125 admitted patients with confirmed Influenza infection. AUC was 0.63 (CI 95%, 0.52–0.74; P < 0.05) for severity and 0.90 (IC 95%, 0.83–0.97; P < 0.05) for mortality, showing better predictive performance than other pneumonia and sepsis scores such as CURB-65, PSI, CROMI, SIRS, SOFA, qSOFA and ILI (Table 1).

**Conclusion.** The FluMex scoring system can be a useful tool for patients with suspected Influenza infection in predicting severity and mortality, helping to improve care and resource management.

**Table 1. FluMex clinical severity index.**

| Variables                      | Cut-off | OR    | CI95%     | p-value |
|-------------------------------|---------|-------|-----------|---------|
| Age > 65 years                | 75      | 1.91  | 1.16 to 3.12 | 0.0083  |
| Body mass index > 30          | 30      | 2.09  | 1.26 to 3.49 | 0.0052  |
| Type 2 diabetes               | 1       | 2.62  | 1.51 to 4.57 | 0.0021  |
| Hypertension                  | 1       | 1.85  | 1.12 to 3.06 | 0.0134  |
| Pulsoximetry < 90%            | 90%     | 1.96  | 1.15 to 3.34 | 0.0117  |
| Respiratory rate > 22 pm      | 22      | 1.91  | 1.16 to 3.12 | 0.0083  |
| Altered mental status         | 1       | 2.09  | 1.26 to 3.49 | 0.0052  |
| Blood urea nitrogen > 19 mg/dL| 19      | 1.91  | 1.16 to 3.12 | 0.0083  |
| Elevated lactate dehydrogenase| 1       | 2.09  | 1.26 to 3.49 | 0.0052  |
| Abnormal chest X-ray          | 1       | 2.09  | 1.26 to 3.49 | 0.0052  |

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