1177. Meterology-driven Prediction of RSV/RHV Incidence in Rural Nepal

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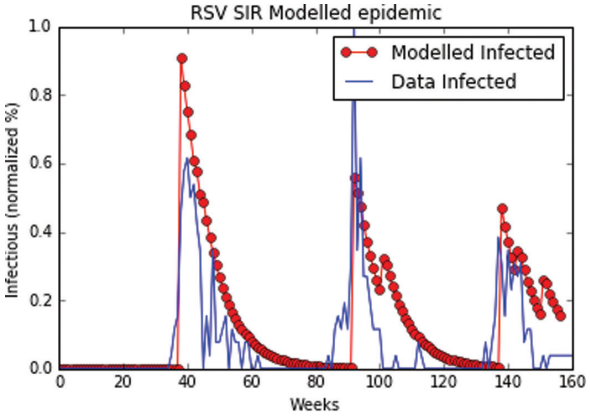
Background. Incidence of respiratory syncytial virus (RSV) and rhinovirus (RHV) varies throughout the year. We aim to quantify the relationship between weather variables (temperature, humidity, precipitation, and aerosol concentration) and disease incidence in order to quantify how outbreaks of RSV and RHV are related to seasonal or sub-seasonal meteorology, and if these relationships can predict viral outbreaks of RSV and RHV.

Methods. Health data were collected in a community-based, prospective randomized trial of maternal influenza immunization of pregnant women and their infants conducted in rural Nepal from 2011–2014. Adult illness episodes were defined as fever plus cough, sore throat, runny nose, and/or myalgia, with infant illness defined similarly but without fever requirement. Cases were identified through longitudinal household-based weekly surveillance. Temperature, humidity, precipitation, and fine particulate matter (PM 2.5) data come from reanalysis data products NCEP, Era-Interim, and Merra-2, which are produced by assimilating historical in-situ and satellite-based observations into a weather model.

Results. RSV exhibits a relationship with temperature after removing the seasonal cycle (r = -0.16, $N = 208$, P = 0.02), and RHV exhibits a strong relationship to daily temperature (r =-0.14, N =208, P = 0.05). When lagging meteorology by up to 15 weeks, correlations with disease count and weather improve (RSV: r_max = 0.45, $P < 0.05$; RHV: r_max = 0.15, $P = 0.05$). We use an SIR model forced by lagged meteorological variables to predict RSV and RHV, suggesting that disease burden can be predicted at lead times of weeks to months.



Conclusion. Meteorological variables are associated with RSV and RHV incidence in rural Nepal and can be used to drive predictive models with a lead time of several months.

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1178. Feasibility and Validation of Viral Respiratory Disease Surveillance in a Combat Theater Using the Filmarray Respiratory Panel

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Background. Viral respiratory infections are a significant threat to deployed military units. Pathogen-based surveillance may be hampered by limitations in trained personnel in theater, difficulty with specimen shipment, and technical issues with equipment maintenance. In this project, we evaluated the performance of the FilmArray respiratory panel at military clinics in Afghanistan and compare results to testing performed in the United States.

Methods. Participants were recruited after presenting at military clinics at Bagram Airfield (BAF), Afghanistan, in 2013–2014 with fever (≥38° C) and respiratory symptoms (cough, dyspnea, chest pain, and/or sore throat). General medical laboratory staff at BAF were trained to operate the FilmArray; nasopharyngeal swabs were obtained and tested in-theater using the FilmArray respiratory panel (Biofire Diagnostics, Salt Lake City, UT). Samples were then shipped to the USAFSAM Applied Technology Center in 50% RNALater (Qiagen, Valencia, CA) without dry ice and then retested using the same panel. Selected influenza isolates then underwent sequencing to evaluate for potential novel circulating strains.

Results. 29 specimens underwent testing. A virus was identified on FilmArray in 22/29 specimens at BAF and 24/29 specimens at USAFSAM, of whom 17/29 had influenza A. Positive results between BAF and USAFSAM were concordant in all cases; 2 of the negative results at BAF were identified as having influenza A and rhinovirus, respectively. Among those with influenza A, all but one had undergone seasonal influenza vaccination. 5 influenza isolates then underwent sequencing; 2 were A(H1N1pdm09) consistent with the predominant 2012–2013 strain, while 3 were A(H3N2) viruses with HA mutations that differed from those in the 2013–2014 vaccine strain. No resistance-associated neuraminidase mutations were identified.

Conclusion. Surveillance using the FilmArray system is effective and feasible in theater by general laboratory staff. H1N1 and H3N2 influenza A viruses predominated in this sample of acute respiratory infections in a deployed military setting despite high vaccination rates. The use of the RNALater preservative is an effective method for specimen transport without requiring a cold chain and may facilitate biosurveillance in remote settings.

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1179. Experience of Sublingual Microcirculation Evaluation in Adults Patients with Severe Dengue

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Background. Severe microcirculatory changes are involved in the pathophysiological mechanisms that lead to irreversible final stages of dengue shock. We report our experience of the evaluation of sublingual microcirculation in adult patients with severe dengue

Methods. Adults patients with severe dengue (by WHO 2009 criteria) were included. Dengue diagnostics was made by positive serology for IgM / IgG, antigen NS1 or PCR. Sublingual Microcirculation (SM) was evaluated by Sidestream Dark Field imaging. Microvascular flow index (MFI), proportion of small-perfused vessels (%SVP), heterogeneity index (HI) and Total Vascular Density were calculated. All patients received Fluids Challenge (FC) at hospital admission.

Results. SM was assessed in 10 patients. The median age was 65 years [IQR: 34–70], 60% were male. Eight patients were admitted to the ICU, of which 63% required invasive ventilatory and vasoactive support. One patient died. After the fluid challenge, the median of the %SVP was 94 [IR: 97 – 77], the median of the MFI was 2.82 [IR: 2, 85 – 2, 14]. There were not significant differences in %SVP and MFI among the patients who survived. In the deceased patient, the %SVP with continuous flow was 59, 18% and the MFI was 1, 45; these values were significantly decreased compared with patients who survived. A significant negative correlation between hematocrit and %SVP, and MFI was found.

Conclusion. Initial fluid challenge, that identifies and treats volume depletion, could correct microcirculation abnormalities evaluated by SDF imaging. However, in the patient who did not respond to this challenge, significant alterations of the MFI and the %SVP were evidenced. There is a need for more studies to improve our understanding of the role of microcirculation evaluation in these patients.

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1180. Identifying Enteropathogens in Children with Acute Gastroenteritis Presenting with Isolated Vomiting–Appetite Study

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