

Conclusion. Granger causality tests are commonly used in economic modeling but have not been routinely applied to infectious diseases. Using this test, we found a strong correlation between weekly cases of hospitalized influenza and iGAS cases, with a 1-week lag between influenza and iGAS septic shock or pneumonia. This approach can provide insight into the potential impact of developing prevention interventions for infections with strong correlation. Further exploration of Granger tests in infectious disease modeling should be considered.

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686. Use of an Influenza-Like Illness School Absenteeism Monitoring System to Identify Seasonal Influenza Outbreaks in the Community: ORCHARDS (Wisconsin, September 2014–June 2017)

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Session: 66. Public Health: Epidemiology and Outbreaks
Thursday, October 4, 2018: 12:30 PM

Background. Schools are purported to be primary venues of influenza transmission and amplification with secondary spread to communities. We assessed K–12 student absenteeism monitoring as a means for early detection of influenza activity in the community.

Methods. We conducted a 3-year, prospective observational study of all-cause (a-TOT), illness-associated (a-I), and influenza-like illness-associated (a-ILI) absenteeism within the Oregon School District, Oregon, WI (OSD: enrollment = 3,900 students). Absenteeism reporting was facilitated by automated processes within OSD's electronic student information system. Students were screened for ILI, and, if eligible, visited at home, where pharyngeal specimens were collected for influenza RT-PCR (IVD CDC Human Influenza Virus RT-PCR Diagnostic Panel) and multipathogen testing (Luminex NxTAG RPP). The study definition of a-ILI was validated for 700 children with acute respiratory infections using binomial logistic regression. Surveillance of medically attended laboratory-confirmed influenza (MAI) occurred in five primary care clinics in and adjoining OSD as part of the Wisconsin Influenza Incidence Surveillance Project using the same laboratory testing. Poisson general additive log linear regression models of daily counts of absenteeism and MAI were compared using correlation analysis.

Results. Influenza A and B were detected in 54 and 51 of the 700 visited students, respectively. Influenza was significantly associated with a-ILI status (OR = 4.74; 95% CI: 2.78–8.18; $P < 0.001$). Of MAI patients, 371 had influenza A and 143 had influenza B. a-I was significantly correlated with MAI in the community ($r = 0.472$; $P < 0.001$) with a 15-day lead time. a-ILI was significantly correlated with MAI in the community ($r = 0.480$; $P < 0.001$) with a 1-day lead time. a-TOT performed poorly ($r = 0.278$; $P < 0.001$), following MAI by 9 days (Figure 1).

Conclusion. Surveillance using cause-specific absenteeism was feasible to implement in OSD and performed well over a 3-year period marked by diverse presentations of seasonal influenza. Monitoring a-I and a-ILI can detect influenza outbreaks in the community, providing early warning in time for community mitigation efforts for seasonal and pandemic influenza.

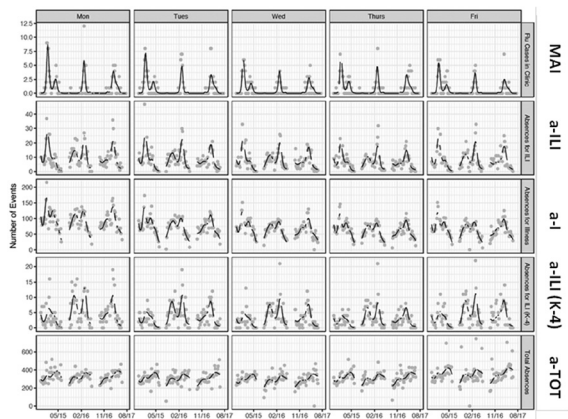


Figure 1. Poisson general additive log linear regression models of daily counts of medically attended influenza in the community (MAI; top row), absenteeism due to influenza-like illness (a-ILI; 2nd row), absenteeism due to illness (a-I; 3rd row), a-ILI in kindergarten through 4th grade (a-ILI K-4; 4th row), and total absenteeism (a-TOT; bottom row), in a study of school absenteeism to detect seasonal influenza outbreaks—Wisconsin, September 2014–June 2017

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687. Modeling the Impact of Introduction of Influenza Vaccination on ILI Cumulative Case Count in Cameroon

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Thursday, October 4, 2018: 12:30 PM

Background. Influenza illness can range from mild to severe, with serious outcomes occurring in children and the elderly. Flu has been studied extensively in geographies where vaccine is often plentiful. The burden of influenza is not well known in tropical regions where vaccine coverage is scant. Our study examines the impact of introducing flu vaccination on cumulative incidence in a Cameroonian population with <0.2% influenza vaccine utilization

Methods. The data consists of 1 year of flu surveillance from patients presenting with influenza-like-illness at clinics in Cameroon. Samples underwent RT-PCR influenza screening. Analysis was performed in Berkeley Madonna. We developed ordinary differential equations (ODEs) under the SEIR compartmental model and calculated R0. We estimated the proportion of cases the clinics observed to make inferences to the catchment population of these health facilities. We developed another set of ODEs to introduce vaccination using a pulse function with a 50% efficacy and 45% vaccination coverage.

Results. We observed 82.9% reduction in flu cases by introducing vaccination at 45% coverage (US average). Cameroon would likely achieve reduced coverage. Therefore, we examined introducing vaccination with 10% coverage, and observed that flu cases were cut by over one third.

Conclusion. This analysis demonstrates that introducing vaccination in Cameroon clinics would reduce influenza cases substantially even with only a small proportion of the population vaccinated. Flu vaccination campaigns should be strongly considered as they can reduce case count which may reduce the likelihood of transmitting flu to those who are at risk the most severe outcomes.

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688. Impact of Expanded Influenza Post-exposure Prophylaxis on Healthcare Worker Absenteeism at a Tertiary Care Center During the 2017–2018 Season

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Session: 66. Public Health: Epidemiology and Outbreaks
Thursday, October 4, 2018: 12:30 PM

Background. A severe 2017–2018 influenza season was expected for the United States. We hypothesized that a surge in influenza cases paired with decreased vaccine effectiveness could increase healthcare worker (HCW) absenteeism. Because of a potential public health emergency during the 2017–2018 season, we offered oseltamivir post-exposure prophylaxis (PEP) to exposed HCWs regardless of vaccination status. We describe PEP uptake, cost, and impact on absenteeism at the University of Iowa Hospital and Clinics (UIHC).

Methods. UIHC serves as a referral and safety net health system for Eastern Iowa. Influenza seasons were defined as the period between Week 40 from 1 year to Week 13 of the following year. During the 2016–2017 season, PEP (75 mg/day for 7 days) was offered free of charge to unvaccinated exposed HCWs. Exposure was defined as proximity within 3 ft of a confirmed influenza-infected person for ≥10 minutes without mask protection, or direct contact with respiratory secretions. During the 2017–2018 season, PEP was expanded to all exposed HCWs regardless of vaccination status. We reviewed surveillance, employee health, pharmacy, and human resources records for the 2016–2017 and 2017–2018 seasons. We defined PEP uptake as prescriptions picked up/all referrals and absenteeism rate as sick-leave requests/scheduled hours.

Results. During the 2016–2017 and 2017–2018 seasons, we detected 373 and 427 confirmed influenza cases among patients at UIHC. HCW vaccination rates were similar: 89.7% and 90.9%. PEP was recommended in 49 exposures during 2016–2017 and 280 exposures during 2017–2018. A total of 22 (44.9%) and 133 (47.5%) HCWs picked up oseltamivir from the pharmacy during the 2016–2017 and 2017–2018 seasons. The estimated cost of oseltamivir was \$1,791 and \$10,828, respectively. Overall, 6,187 sick-leave requests (median = 12 hours, absenteeism rate = 3.2%), and 6,174 sick-leave requests (median = 12 hours, absenteeism rate = 3.4%) were reported during the 2016–2017 and 2017–2018 seasons.

Conclusion. Influenza case counts mildly increased from the 2016–2017 to the 2017–2018 season. Expanding PEP to all exposed HCWs, regardless of vaccination status, had moderate uptake and was costly. Absenteeism rates remained similar during both seasons.

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689. Narcolepsy During the 2009–2010 H1N1 Pandemic

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Thursday, October 4, 2018: 12:30 PM