2062. Improving Antibiotic Prescribing in the Ambulatory Care Setting—Stewardship through Influenza Vaccination, US Flu VE Network 2013–2014 Through 2017–2018
Emily Smith, MPH1; Alicia M. Fry, MD, MPH1; Lauri Hicks, DO2; Katherine E. Fleming-Dutra, MD3; Emily T. Martin, PhD, MPH2; Richard Zimmerman, MD, PhD4; Michael L. Jackson, PhD, MPH4; Huong McLean, PhD, MPH5; Scott C. Olson, MD6; Manjusha Gagliani, MBB8; Brendan Flannery, PhD7; Jill Ferdinands, PhD, MSc8; Manish Patel, MD9; Mary Patricia Nowalk, PhD10;
1Centers for Disease Control and Prevention, Atlanta, Georgia; 2CDC, Atlanta, Georgia; 3University of Michigan School of Public Health, Ann Arbor, Michigan; 4University of Pittsburgh Schools of Health Sciences, Pittsburgh, Pennsylvania; 5Kaiser Permanente Washington Health Research Institute, Seattle, Washington; 6Marshfield Clinic Research Institute, Marshfield, Wisconsin; 7Texas A&M University HSC COM, Temple, Texas; 8US Centers for Disease Control and Prevention, Atlanta, Georgia; 9US Centers for Disease Control and Prevention, Influenza Division, Atlanta, Georgia
Session: 238. Antibiotic stewardship: Non-Inpatient Settings Saturday, October 5, 2019: 12:15 PM

Background. Improving antibiotic use is a key strategy to combat antibiotic resistance and improve patient safety. Acute respiratory illness (ARI) is a common cause of outpatient visits and accounts for ~41% of antibiotics used in the United States. We sought to determine the proportion of antibiotic prescriptions (Rx) prescribed among outpatients with ARI that can be potentially averted through influenza vaccination.

Methods. From 2013–2014 through 2017–2018 influenza seasons, we enrolled patients aged ≥6 months with ARI in the US Influenza Vaccine Effectiveness (VE) Network of >50 outpatient clinics. Antibiotic Rx and diagnosis codes were collected from medical records. Study influenza test results were not available to treating clinicians at most sites, and clinical influenza testing was infrequently performed (a), prevalence of influenza among unvaccinated ARI patients (b), prevalence of antibiotic Rx among unvaccinated influenza-positive ARI patients (c) and prevalence of antibiotic Rx among ARI patients overall (d), we derived estimates of the proportion of ARI antibiotic Rx that can be averted by influenza vaccination [(a + b + c)/d].

Results. Among 37487 outpatients with ARI, 13,316 (36%) were prescribed an antibiotic and 9,689 (26%) tested positive for influenza. Of those positive, 2,496 (26%) by preventing influenza-associated ARI syndromes, influenza vaccination may substantially reduce antibiotic prescribing. Increasing influenza vaccine coverage and improving protection may facilitate national goals to improve antibiotic use and reduce the global threat of antibiotic resistance.

Conclusion. By preventing influenza-associated ARI syndromes, influenza vaccination may substantially reduce antibiotic prescribing. Increasing influenza vaccine coverage and improving protection may facilitate national goals to improve antibiotic use and reduce the global threat of antibiotic resistance.

Disclosures. All authors: No reported disclosures.

2063. Using Twitter Data and Machine Learning to Identify Outpatient Antibiotic Misuse: A Proof-of-Concept Study
Timothy Sullivan, MD; Icahn School of Medicine at Mount Sinai, New York, New York
Session: 238. Antibiotic stewardship: Non-Inpatient Settings Saturday, October 5, 2019: 12:15 PM

Background. Outpatient antibiotic misuse is common, yet it is difficult to identify and prevent. Novel methods are needed to better identify unnecessary antibiotic use in the outpatient setting.

Methods. The Twitter developer platform was accessed to identify Tweets describing outpatient antibiotic use in the United States between November 2018 and March 2019. Unique Reporting ambulance, or not describing misuse. Possible misuse was defined as antibiotic use for a diagnosis or symptoms for which antibiotics are not indicated based on national guidelines, or the use of antibiotics without evaluation by a healthcare provider (Figure 1). Tweets were randomly divided into training and testing sets consisting of 80% and 20% of the data, respectively. Training set Tweets were pre-processed via a natural language processing pipeline, converted into numerical vectors, and used to generate a logistic regression algorithm to predict misuse in the testing set. Analyses were performed in Python using the scikit-learn and nltk libraries.

Results. 4000 Tweets were included, of which 1028 were labeled as describing possible outpatient antibiotic misuse. The algorithm correctly identified Tweets describing possible antibiotic misuse in the testing set with specificity = 94%, sensitivity = 55%, PPV = 75%, NPV = 87%, and area under the ROC curve = 0.91 (Figure 2).

Conclusion. A machine learning algorithm using Twitter data identified episodes of self-reported antibiotic misuse with good test performance, as defined by the area under the ROC curve. Analysis of Twitter data captured some episodes of antibiotic misuses, such as the use of non-prescribed antibiotics, that are not easily identified by other methods. This approach could be used to generate novel insights into the causes and extent of antibiotic misuse in the United States, and to monitor antibiotic misuse in real time.

Disclosures. All authors: No reported disclosures.

2064. Applying Human Factors and Ergonomics to Inform a Successful Fluoroquinolone Restriction Intervention: A Mixed Methods Pilot Study
Jessica Tischendorf, MD, MS1; Matthew Brunner, MD2; Lucas Schulz, PharmD3; Anna K. Barker, PhD3; Alexander Lepak, MD4; Alexander Lepak, MD1; Mary J. Knobiloch, PhD, MPH5; Marc-Oliver Wright, MT(ASCP), MS, CIC, FAPIC6; Nasia Safdar, MD, PhD7;
1University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin; 2University of Wisconsin Health, Verona, Wisconsin; 3University of Wisconsin, Madison, Madison, Wisconsin; 4University of Wisconsin-Madison School of Medicine and Public Health, Madison, Wisconsin; 5University of Wisconsin-Madison School of Medicine and Public Health, Madison, Wisconsin; 6University of Wisconsin, School of Medicine and Public Health, Madison, Wisconsin; 7University of Wisconsin Hospitals and Clinics, Monona, Wisconsin; 8University of Wisconsin-Madison School of Medicine and Public Health, Madison, Wisconsin
Session: 238. Antibiotic stewardship: Non-Inpatient Settings Saturday, October 5, 2019: 12:15 PM

Background. Outpatient antibiotic misuse is common, yet it is difficult to identify and prevent. Novel methods are needed to better identify unnecessary antibiotic use in the outpatient setting.

Methods. The Twitter developer platform was accessed to identify Tweets describing outpatient antibiotic use in the United States between November 2018 and March 2019. Unique Reporting ambulance, or not describing misuse. Possible misuse was defined as antibiotic use for a diagnosis or symptoms for which antibiotics are not indicated based on national guidelines, or the use of antibiotics without evaluation by a healthcare provider (Figure 1). Tweets were randomly divided into training and testing sets consisting of 80% and 20% of the data, respectively. Training set Tweets were pre-processed via a natural language processing pipeline, converted into numerical vectors, and used to generate a logistic regression algorithm to predict misuse in the testing set. Analyses were performed in Python using the scikit-learn and nltk libraries.

Results. 4000 Tweets were included, of which 1028 were labeled as describing possible outpatient antibiotic misuse. The algorithm correctly identified Tweets describing possible antibiotic misuse in the testing set with specificity = 94%, sensitivity = 55%, PPV = 75%, NPV = 87%, and area under the ROC curve = 0.91 (Figure 2).

Conclusion. A machine learning algorithm using Twitter data identified episodes of self-reported antibiotic misuse with good test performance, as defined by the area under the ROC curve. Analysis of Twitter data captured some episodes of antibiotic misuses, such as the use of non-prescribed antibiotics, that are not easily identified by other methods. This approach could be used to generate novel insights into the causes and extent of antibiotic misuse in the United States, and to monitor antibiotic misuse in real time.

Disclosures. All authors: No reported disclosures.