Figure 2. Boxplots of the number of nucleotide differences (y-axis) between UK samples and CCU samples using the PAO1 reference (left) and PAK reference (right)

Fig. 2

source and multiple-source outbreaks can prevent inaccurate classification and reporting of HAIs, avoiding unnecessary costs and damage to hospital reputations.

Presentation Type:
Poster Presentation

Using Whole-Genome Sequencing to Improve Surveillance Measures: Case Study of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in a Florida Hospital

Susanna Lamers, BioInfoExperts LLC; David Nolan, Bioinfoexperts, LLC; Yvette Simone McCarter, University of Florida College of Medicine-Jacksonville; Chad Neilsen, UF Health Jacksonville; Rebecca Rose, Bioinfoexperts, LLC; Christopher Rodriguez, BioInfoExperts, LLC; Stephanie Cross, BioInfoExperts LLC

Background: The CDC considers methicillin-resistant *Staphylococcus aureus* (MRSA) one of the most important hospital-acquired infections (HAIs) in the United States. However, infection control departments (ICDs) often rely on subjective data to determine whether multiple MRSA cases are a true outbreak and whether the hospital is responsible (community- vs hospital-acquired). **Objective:** Our objective was to determine whether whole-genome sequencing (WGS) of MRSA provided new insights into on transmission dynamics at large, inner-city hospital in Jacksonville, Florida. **Methods:** Over a 4-month period, MRSA samples were obtained from 44 infected patients at 3 campuses within a single hospital system. Limited nonpatient identifying information was obtained, including date of collection, campus, unit, reason for admission, and days post admission (DPA) of MRSA diagnosis. Whole-genome sequences were generated using the Illumina platform. Raw reads were processed, and genetic distances were calculated and used to identify genetically linked bacterial infections using FoxSeq version 1.0 software. **Results:** Based on their length of stay, 10 patients were reported by the ICD as obtaining an HAI. Three distinct "episodes" were evident in which >5 MRSA cases were observed within a 3–5-day period. Genomic analysis identified 5 clusters of linked infections: 4 clusters contained 2 patients and another contained 3. Of these clusters, only 1 contained multiple cases that were reported as HAIs; however, because these case were separated by 2 weeks, it is unlikely that they came from a source in the hospital. The results suggest that HAIs were overreported and that most MRSA present in the hospital likely came from community sources. **Conclusions:** WGS provided clear evidence that temporally clustered MRSA cases do not imply an outbreak is occurring. Furthermore, ongoing detection of the same community-acquired infections over several months is indicative of a shared source outside of the hospital, which could be uncovered through examination of clinical records. Considering the implications of HAIs, best approaches to combat them should include identifying their sources. As molecular surveillance approaches to infection control are rapidly becoming
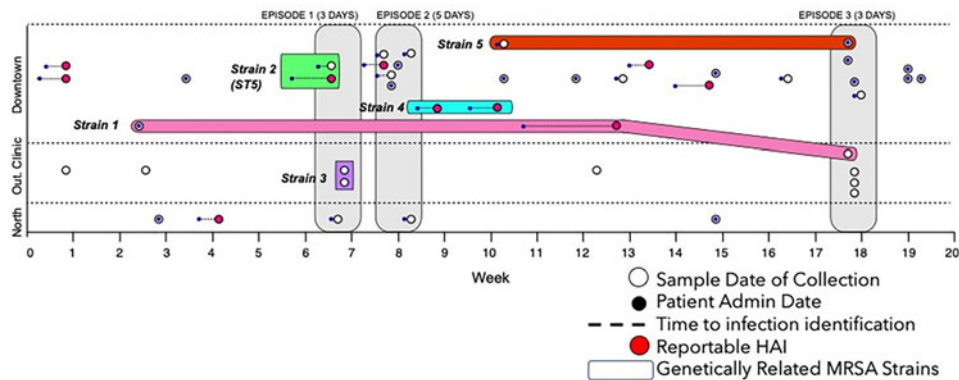
44 MRSA cases over 20 weeks in a hospital

Fig. 1

easier and less expensive, the methods can be used to bring objective clarity to the ICD.

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Presentation Type:
Poster Presentation

Utilizing Behavioral Science to Improve Antibiotic Prescribing in Rural Urgent Care Settings

Patricia Cummings, Eisenhower Health; Rita Alajajian, Eisenhower Health; Larissa May, University of California Davis; Russel Grant, Eisenhower Health; Hailey Greer, Eisenhower Health; Massoud Dezfuli, Eisenhower Healthcare Center

Background: The rate of inappropriate antibiotic prescribing for acute respiratory tract infections (ARTIs) is 45% among urgent care centers across the United States. To contribute to the *US National Action Plan for Combating Antibiotic-Resistant Bacteria*, which aims to decrease rates of inappropriate prescribing, we implemented 2 behavioral nudges using the evidence-based MITIGATE tool kit from urgent-care settings, at 3 high-volume, rural, urgent-care centers. **Methods:** An interrupted time series (ITS) analysis was conducted comparing a preintervention phase during the 2017–2018 influenza season (October through March) to the intervention phase during the 2018–2019 influenza season. We compared the rate of inappropriate or non–guideline-concordant antibiotic prescribing for ARTIs across 3 urgent-care locations. The 2 intervention behavioral nudges were (1) staff and patient education and (2) peer comparison. Provider education included presentations at staff meetings and grand rounds, and patient

Figure 1. Trends of acute respiratory tract infection (ARTI) encounters, antibiotic prescriptions written for ARTI, and rate of inappropriate prescribing for ARTI in three urgent care centers, by month and year from July 2017-April 2019 (n=12,502 antibiotic prescriptions written / n=18,840 ARTI encounters).
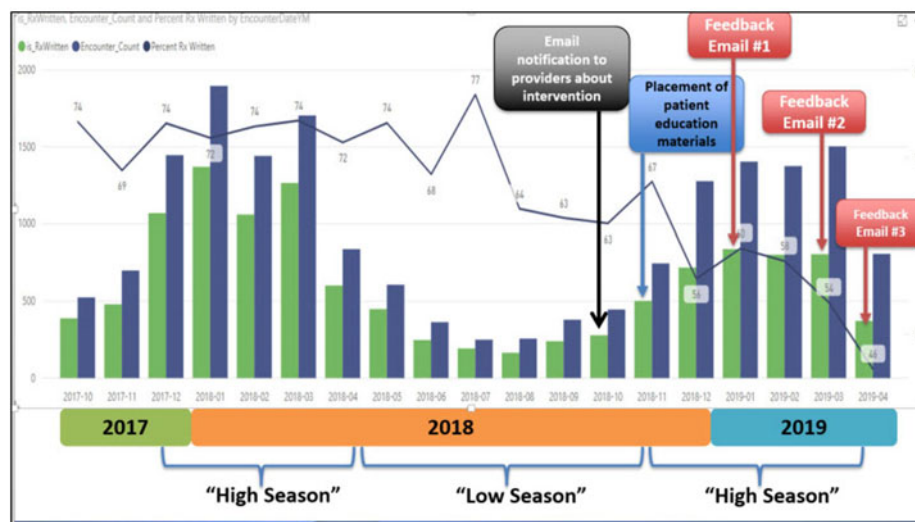

Fig. 1.