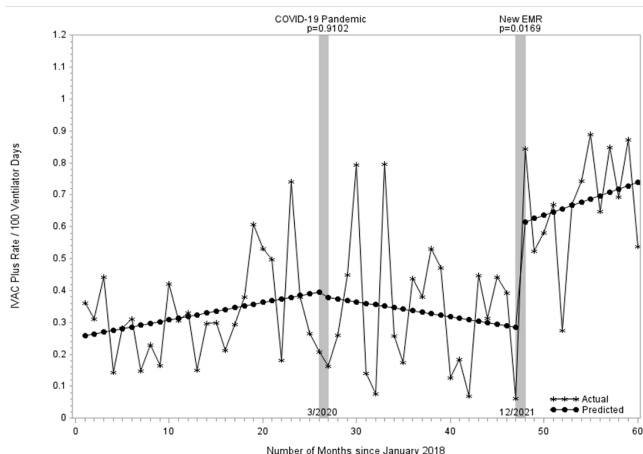


Figure 1: Interrupted Time Series Analysis of Infection-Related Ventilator Associated Events and Probable Ventilator Associated Pneumonias (IVAC Plus) Rates from January 2018 – November 2022



compared across periods using the χ^2 test. All analyses were performed using SAS version 9.4 software. **Results:** COVID-19 has been implicated in the increasing number of VAEs since the pandemic began: 6% of patients in 2020, 18% in 2021, and 23% in 2022 ($P < .001$). The percentage of patients meeting criteria for VAE by positive end-expiratory pressure (PEEP) decreased from 2018 to 2022 (92%, 95%, 93%, 85%, 85%, respectively; $P = .0004$). Patients meeting criteria for VAE by fraction of inspired oxygen (FiO₂) increased from 2018 to 2022 (9%, 6%, 11%, 17%, 19%, respectively; $P = .0002$). Manual review of 2022 data indicated opportunities for test stewardship in 8 of 65 patients with cultures (12%). ITS analysis revealed that IVAC+ rates were climbing prior to the onset of the COVID-19 pandemic (Fig. 1). We observed a marked increase in rates with the implementation of our new EMR and the changes to our surveillance process (0.32 cases per 100 ventilator days). Manual review of records from 2022 revealed 5 patients in which documentation of ventilator settings to meet VAE diagnosis could not be retrieved from flow sheets. **Conclusions:** COVID-19 continues to affect VAE despite vaccine availability and may partially account for elevated rates nationwide. However, changes in EMR-automated VAE surveillance may also affect rates. Our findings suggest that automated surveillance captures transient or spurious changes in ventilator machine settings that do not accurately represent clinical status. These data may contribute to spurious increases in VAE. More studies are needed to better understand the impact of both COVID-19 and automated surveillance on VAE.

Disclosures: None

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Presentation Type:

Poster Presentation - Oral Presentation

Subject Category: Antibiotic Stewardship

Validation of an electronic algorithm to identify appropriate antibiotic use for community-acquired pneumonia in children

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Background: Community-acquired pneumonia (CAP) is a common indication for antibiotic use in hospitalized children and is a key target for pediatric antimicrobial stewardship programs (ASPs). Building upon prior work, we developed and refined an electronic algorithm to identify children hospitalized with CAP and to evaluate the appropriateness of initial antibiotic choice and duration. **Methods:** We performed a cross-sectional study including children 6 months to 17 years hospitalized for CAP between January 1, 2019, and October 31, 2022, at a tertiary-care children’s hospital. CAP was defined electronically as an *International Classification*

Table 1. Performance Characteristics of an Electronic Algorithm Evaluating Appropriate Antibiotic Choice and Duration

Appropriate Choice	
Sensitivity	94% (75/80)
Specificity	NA (0/0)
Positive Predictive Value	100% (75/75)
Negative Predictive Value	0% (0/5)
Appropriate Duration	
Sensitivity	88% (14/16)
Specificity	97% (62/64)
Positive Predictive Value	88% (14/16)
Negative Predictive Value	97% (62/64)

of Disease, Tenth Revision (ICD-10) code for pneumonia, a chest radiograph or chest computed tomography scan (CT) performed within 48 hours of admission, and systemic antibiotics administered within the first 48 hours of hospitalization and continued for at least 2 days. We applied the following exclusion criteria: patients transferred from another health-care setting, those who died within 48 hours of hospitalization, children with complex chronic conditions, and those with intensive care unit stays >48 hours. Criteria for appropriate antibiotic choice and duration were defined based on established guidelines. Two physicians performed independent medical record reviews of 80 randomly selected patients (10% sample) to evaluate the performance of the electronic algorithm in (1) identifying patients treated for clinician-diagnosed CAP and (2) classifying antibiotic choice and duration as appropriate. A third physician resolved discrepancies. The electronic algorithm was compared to this medical record review, which served as the reference standard. **Results:** Of 80 children identified by the electronic algorithm, 79 (99%) were diagnosed with CAP based on medical record review. Antibiotic use was classified as the appropriate choice in 75 (94%) of 80 cases, and appropriate duration in 16 (20%) of 80 cases. The sensitivity of the electronic algorithm for identifying appropriate initial antibiotic choice was 94%; specificity could not be calculated because no events of inappropriate antibiotic choice were identified based on chart review. The sensitivity and specificity for determining appropriate duration were 88% and 97%, respectively (Table 1).

Conclusions: The electronic algorithm accurately identified children hospitalized with CAP and demonstrated acceptable performance for identifying appropriate antibiotic choice and duration. Use of this electronic algorithm may improve the efficiency of stewardship activities and could facilitate alignment with updated accreditation standards. Future studies validating this algorithm at other centers are needed.

Disclosures: None

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Poster Presentation - Oral Presentation

Subject Category: Antibiotic Stewardship

Trends and duration of antibacterial drug supply chain issues in the United States, January 2017–January 2022

Katie Suda; Katherine Callaway Kim; Inma Hernandez and Mina Tadrous

Background: Drug manufacturing and distribution is a complex, global process. The global drug supply chain is prone to disruptions associated with geopolitical issues, trade, civil unrest, severe weather, and pandemics, all of which have the potential to affect medication supply and result in drug shortages. To our knowledge, the extent to which the supply of antimicrobials is threatened due to disruptions in the drug supply chain in the United States is unknown. We examined trends and duration of disruptions to the drug supply chain for antimicrobials. **Methods:** Manufacturer reports of supply disruptions were extracted from the Food and Drug Administration (FDA) and the American Society for Health-Systems Pharmacists (ASHP) websites and merged on the agent-

formulation level. For each month of the study period, a drug was considered to have an active supply chain issue if an FDA or ASHP shortage or recall report overlapped with that month for ≥ 15 days, or if a discontinuation had occurred within the previous 3 months. Total months of supply chain issues were summed for antimicrobials overall, at the agent formulation, and class levels. A Mann-Kendall test was used to determine the significance of trends in supply-chain issues. **Results:** Of 105 antimicrobials purchased in the United States, 74 (70%) had a supply-chain issue for ≥ 1 month from January 15, 2017, to June 30, 2022. Combined, the 74 agents had 1,611 total months of supply-chain issues over the 66-month study period. Agents from the penicillin class were most frequently affected (ie, 80% of penicillins had supply-chain issues for 206 months), but cephalosporins had supply-chain issues for the longest duration (66% of cephalosporins for 653 months). From 2017–2021, supply-chain issues decreased significantly for penicillins and quinolones (tests of trend, $P = .01$ and $.02$, respectively). No trend was identified for the other classes or antimicrobials overall. Interestingly, supply-chain issues for most classes did not increase with seasonal increases in antimicrobial use. Also, supply-chain issues affected 33 antimicrobial agents for at least half of the study period, and supply-chain issues affected ampicillin-sulbactam, cefotaxime, ceftazidime, cefotetan, cefepime, clindamycin, vancomycin for 100% of the study period. **Conclusions:** Drug supply-chain issues commonly affect antimicrobials and are not improving for most classes. Drug supply-chain issues cause significant strain on healthcare, including drug procurement, access to optimal therapy, and poses challenges to prescribing and antimicrobial stewardship. To decrease the threat to the antibacterial drug supply, action should be taken to strengthen the drug supply chain to ensure access to these essential medicines.

Disclosures: None

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Presentation Type:

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Subject Category: Antibiotic Stewardship

Understanding refugee and immigrant health literacy and beliefs toward antimicrobial resistance

Joseph Ladines-Lim; Elizabeth Scruggs; Tessa Adzemovic; Rachel Croxton; Ron Romero; Michael Lukela; Preeti Mehrotra and Payal Patel

Background: Antimicrobial resistance (AMR) is a global health threat, particularly in refugee populations, due to challenges posed by migration. Little guidance has been provided by public health agencies regarding antimicrobial stewardship specific to this demographic. Studies have primarily focused on encampment areas abroad. We sought to better understand health literacy and beliefs regarding AMR in local refugee and immigrant populations in southeastern Michigan. **Methods:** From November 1, 2022 to March 10, 2023, we distributed an anonymous questionnaire to adult patients at four primary care clinics in Southeastern Michigan and made it available online. The questionnaire collected demographic information and used 5-point Likert scale responses regarding antibiotic use in children with symptoms of respiratory infection. We binarized the questions and responses to determine whether respondents provided the preferred response and added these to create an overall health literacy score, then used simple linear and multivariable linear regression modeling to identify demographic variables independently associated with the health literacy score. Chi-squared and Mann-Whitney tests were also performed where appropriate. **Results:** Immigrants and refugees/asylum-seekers from low or middle-income countries (group A, $n = 109$) were compared to native-born Americans and immigrants from high-income countries (group B, $n = 171$) with participants from 40 countries (Figure 1). Age distribution did not differ between groups, while group B had generally longer duration of living in the United States (Figure 2). Differences were found in other demographic categories except female gender, with group B reporting higher income, educational levels, and English ability (Figure 3). Simple linear regression revealed that all demographic variables except age significantly correlated with responses (Figure 4). Multivariable linear regression

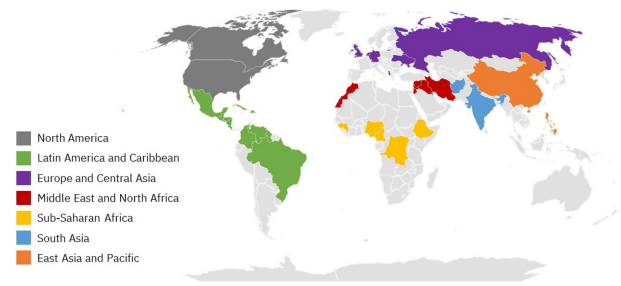


Figure 1: Map displaying countries of origin of research participants from 40 different countries. Countries highlighted in colors divided by region per the World Bank.

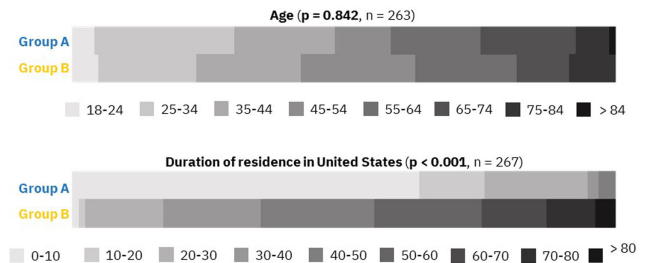


Figure 2: Distribution of age and duration of residence in United States of groups A and B.

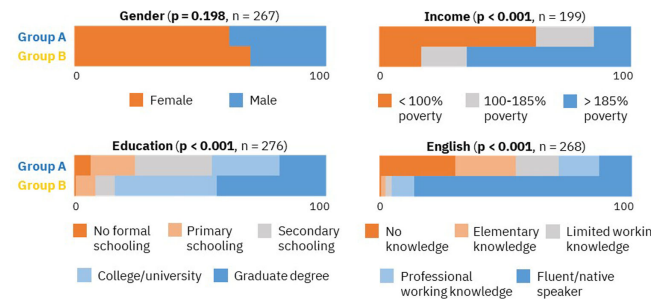


Figure 3: Proportion of gender, distribution of income level, educational level, and English ability of groups A and B. Federal poverty income level for household of four was utilized.

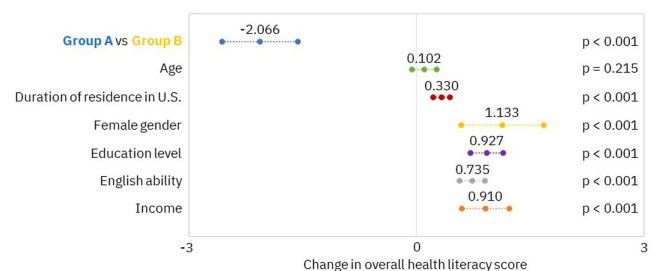


Figure 4: Size effect of demographic variables in simple linear regression with health literacy score. End points show 95% confidence intervals.