

Antibiotic Utilization and the COVID-19 Surge in Detroit

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Background

- Antibiotic overuse during the COVID-19 pandemic is increasingly being reported, despite infrequent bacterial co-infection
- “Just in case” empiric antibiotics were administered to over half of COVID-19 admissions in a study conducted at 38 Michigan hospitals¹
- We explored antibiotic utilization before, during and after the COVID-19 peak in hospitalizations

Methods

Study Design

- Cross sectional study January 2019 through June 2020

Setting and Population

- Henry Ford Hospital, a 877-bed tertiary care hospital in Detroit, Michigan
- The study was granted exempt status by the HFH Institutional Review Board

Included Antibiotic Data:

- Azithromycin
- Ampicillin-sulbactam
- Ceftriaxone
- Cefepime
- Doxycycline
- Linezolid
- Meropenem
- Moxifloxacin
- Piperacillin-tazobactam
- Vancomycin
- National Healthcare Safety Network (NHSN) Antimicrobial Use (AU) Standardized Antimicrobial Administration Ratio (SAAR) data

Data Collection

- Days of therapy per 1000 patient days present at the hospital and location level were extracted from the electronic medical record (Epic™ Buggy)
- SAAR data were extracted from NHSN AU module
- The count of patients hospitalized with COVID-19 was measured each day

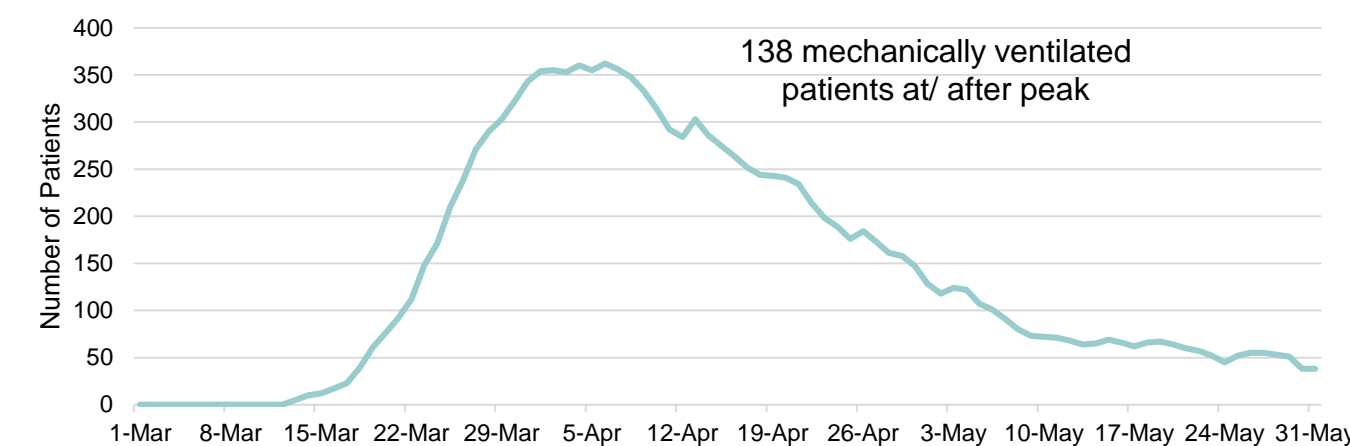
Analysis

- Descriptive analysis was utilized

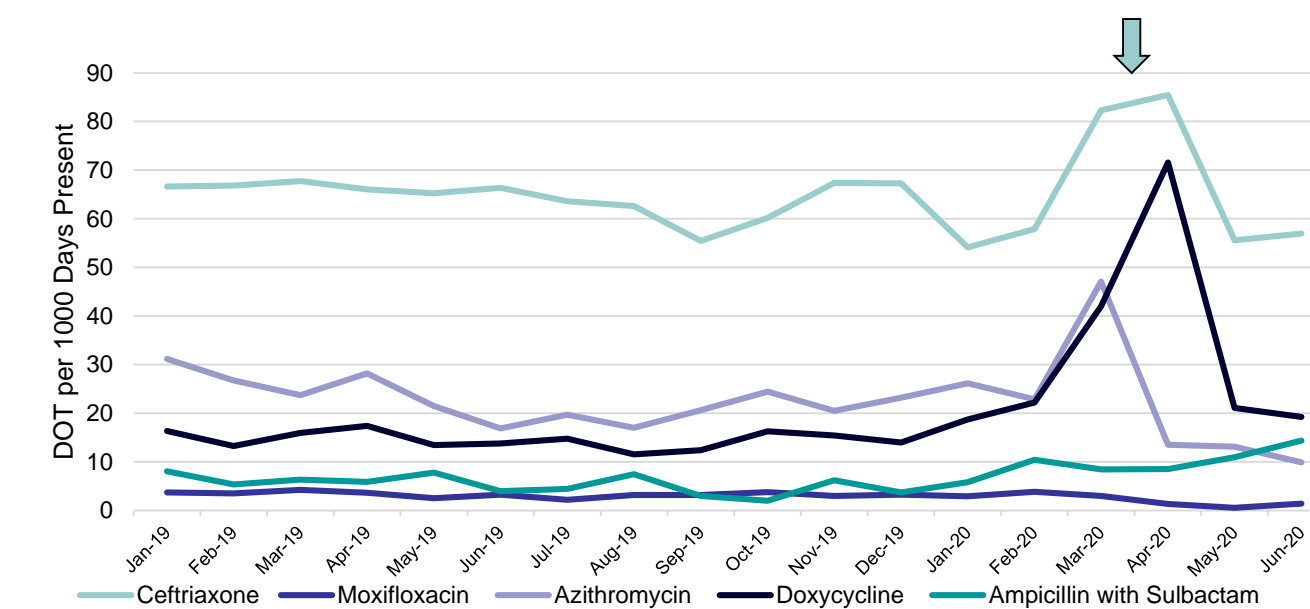
Results

- The first case of SARS-CoV-2 in the health system was detected on March 13, 2020
- In-house polymerase chain reaction testing was implemented March 16, 2020
- Peak in hospitalizations occurred on April 6, 2020 (362) (represented by arrows)

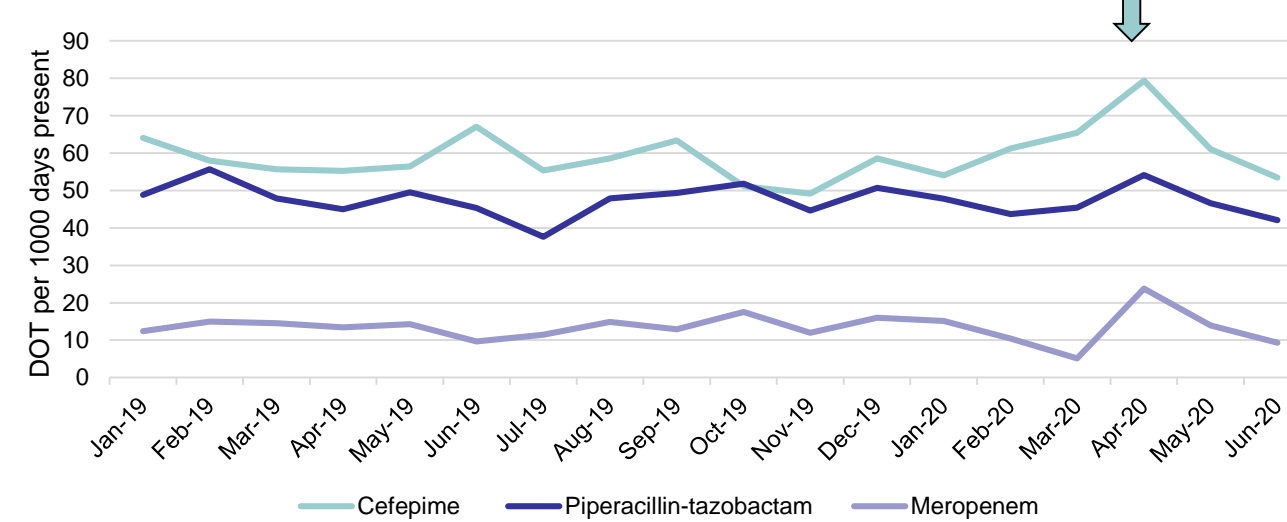
COVID-19 Hospitalizations per Day at Henry Ford Hospital



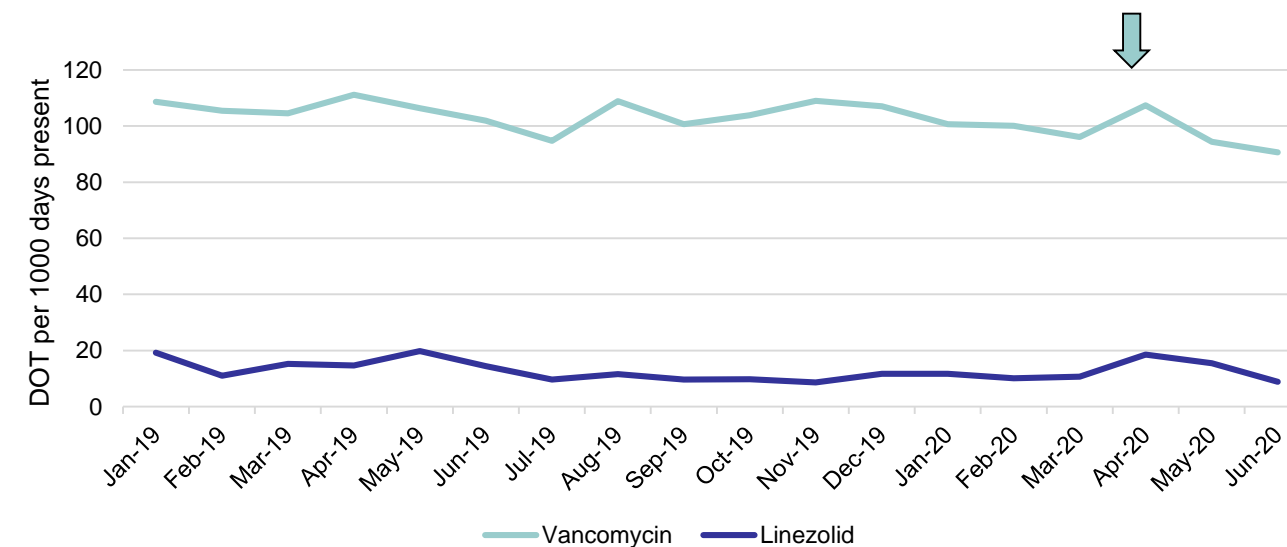
Community-Acquired Pneumonia Antibiotic Utilization



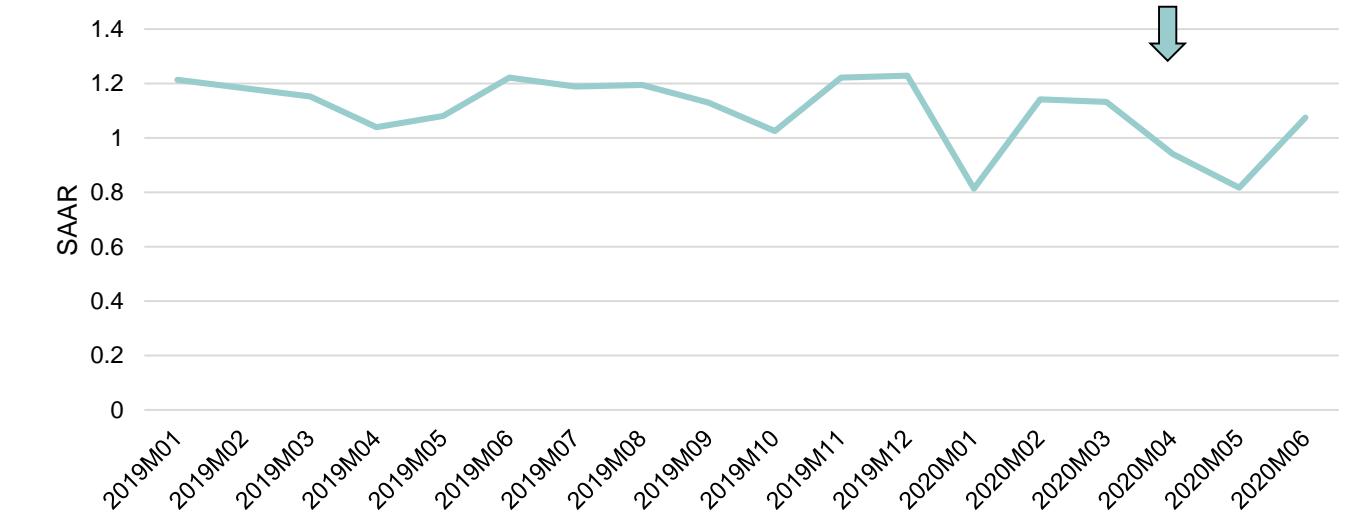
Antipseudomonal Antibiotic Utilization



Gram-positive Agent Utilization

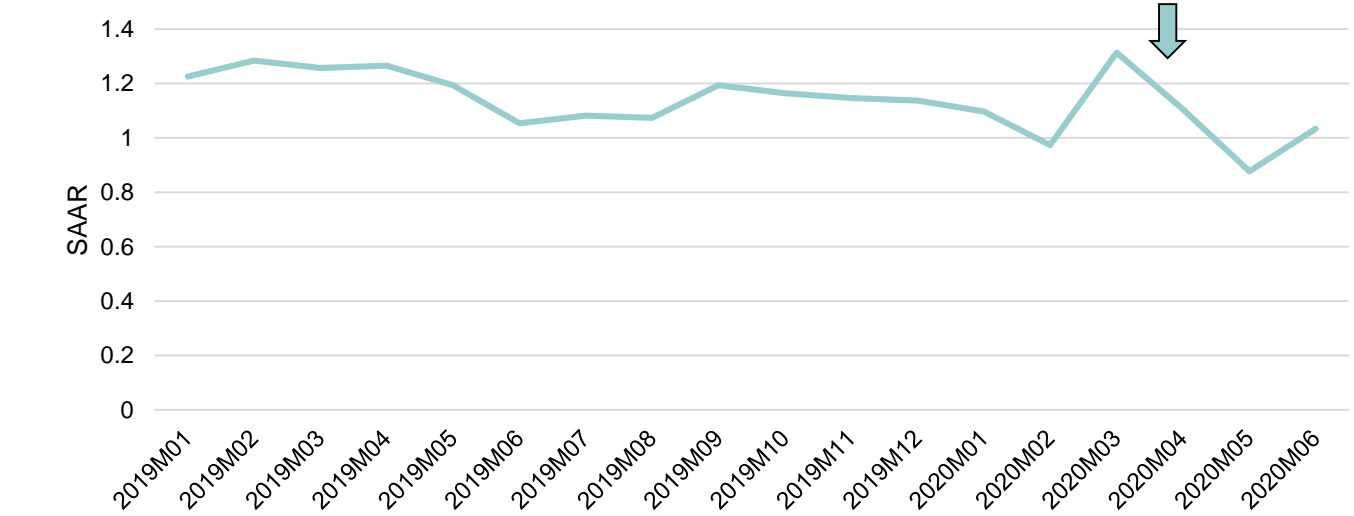


NSHN Broad-spectrum Community-acquired ICU SAAR



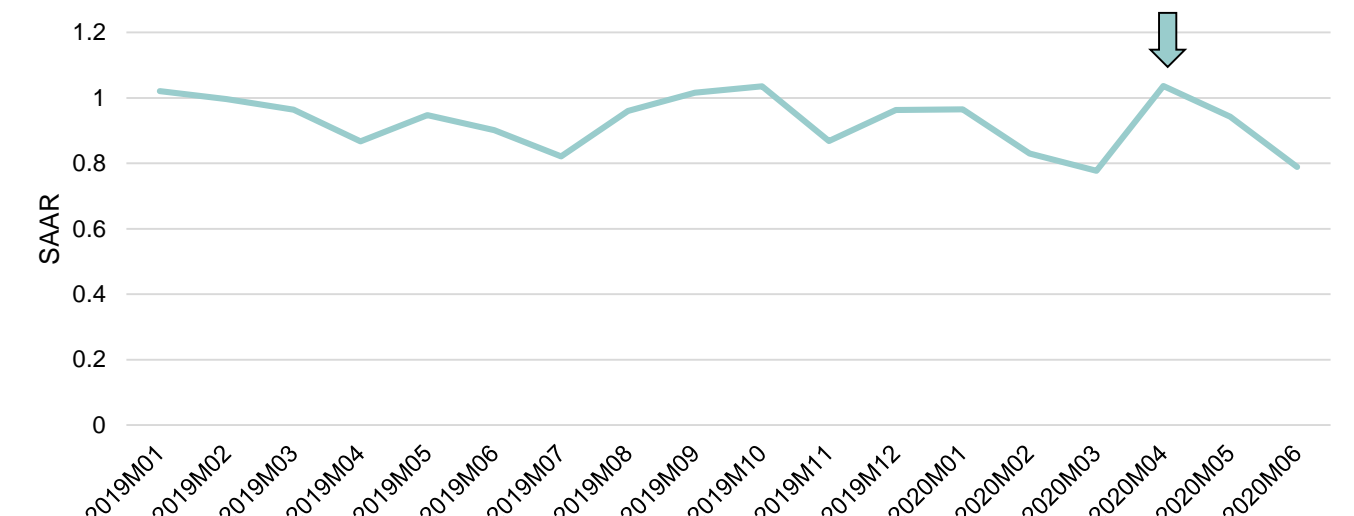
Includes 2nd and 3rd generation cephalosporins, fluoroquinolones, ertapenem

NSHN Broad-spectrum Community-acquired Ward SAAR



Includes 2nd and 3rd generation cephalosporins, fluoroquinolones, ertapenem

NSHN Broad-spectrum Hospital-onset ICU



Includes antipseudomonal beta-lactams, carbapenems, aminoglycosides

Summary

- We observed increased antibiotic use during the peak in COVID-19 hospitalizations, with a return to baseline levels in May and June 2020
- Ceftriaxone, antipseudomonal antibiotics, azithromycin and doxycycline utilization peaked in parallel with hospitalizations
- Redeployment of hospital units for intensive care presented a practical barrier to NHSN AU reporting and is a limitation of the AU data
- COVID-19 presents an opportunity for antimicrobial stewardship programs to optimize care and minimize unnecessary antibiotic use and harm

Disclosure: All authors report no conflicts of interest