

antibiotic guidelines were developed during the pandemic period. AU rates were monitored quarterly to determine the effects of the AS interventions to prescribing practices.

**Results.** Total and specific AU rates were higher (up to 34% and 80%, respectively) in our index hospital compared to other non-teaching hospitals nationally prior to the pandemic. Total antibiotic utilization increased by only 5.5% in the 2<sup>nd</sup> quarter 2020, peak of AU during the pandemic. Total, vancomycin, piperacillin-tazobactam and quinolone utilization rates decreased by 19%, 41%, 38%, and 52%, respectively, at 1<sup>st</sup> quarter 2021 compared to 4<sup>th</sup> quarter 2019. Steeper decreases were noted with implementation of educational activities. Ceftriaxone use remained high and was 50% greater than comparator hospitals at 1<sup>st</sup> quarter 2021.

**Conclusion.** Although problematic during the COVID-19 pandemic, AS can have significant impact on provider prescribing practices and decrease total and specific antibiotic utilization rates. The use of ceftriaxone, an antibiotic commonly used for empiric bacterial coverage for community acquired pneumonia, presents as a continuing challenge.

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### 150. Improved Susceptibility of *Pseudomonas aeruginosa* to Cefepime (CEF) at a Veterans Tertiary Care Hospital, over a 7-Year Period (2011-2017): The Impact of Antibiotic Rotation/Cycling and Reversal of Drug Resistance in *P. aeruginosa*

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**Session:** P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

**Background.** *Pseudomonas aeruginosa* continues to be an important cause of nosocomial infections associated with a high morbidity and mortality. Despite the availability of ceftazidime-avibactam (CAZ-AVI) and ceftolozone-tazobactam (CFT-TAZO), CEF continues to be an empiric agent of choice in several institutions. **Aim:** To evaluate the prevalence and trend in susceptibilities of *P. aeruginosa* to CEF over a 7-year period, identify possible correlation with the use of CAZ, AZI, PTZ, CIP, and CAR, (DOT/1000 patient days), as a quality improvement (QI) measure for optimizing CEF use, introduce antibiotic cycling as a tool to avoid emergence of drug-resistance in *P. aeruginosa*.

**Methods.** A retrospective review of antimicrobial susceptibility data of all isolates of *P. aeruginosa*, (inpatient and outpatient) at the Detroit VAMC pre and post implementation of antibiotic cycling, over a 7-year period (2011-2017) was performed. Susceptibility testing was performed by reference broth micro-dilution methods in a central laboratory. Data analysis was performed using Pearson correlation coefficient score. Being a QI project, clinical data were not reviewed.

**Results.** A total of 977 isolates were identified during the study period. (drug usage are in DOT/1000 PD); CAZ and AZT use surged during 2013-14 from 5 to 8 dropping in 2015-17 to < 3; PTZ usage increased to 100 during 2011-14 but dropped to 38 in 2015-17 (drug shortage); CAR use averaged at 10 until 2016 and dropped to 8 in 2017; CIP use dropped by 50% from 30 in 2012 to 15 in 2017; *P. aeruginosa* susceptible to CEF decreased from 88% in 2012 to 81% in 2014 mirroring the increased use of CEF, AZT, CAZ, and CIP; AG use was very low at < 5. With restrictions on the use of AZT, CAZ, and CIP, from 2014-15, CEF susceptibility increased significantly to 95.5% in 2015. Drug shortage of PTZ in 2015 and increased use of CEF from 2015-17 led to a drop in susceptibility to (82%); *P. aeruginosa* susceptible to CAR and AG averaged at 88% and 97% respectively (2011-17). However, reintroduction PTZ, resulted in improved susceptibility of *P. aeruginosa* to CEF by 40% within a year.

**Conclusion.** Judicious antimicrobial use and antibiotic rotation play a significant role in reversing drug resistance in *P. aeruginosa*.

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### 151. Association Between Outpatient Antibiotic Prescribing, Antimicrobial Resistance, and Initial Presentation to Inpatient Setting for Urinary Tract Infections Among Older Adults in New York State

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**Session:** P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

**Background.** Antibiotic prescribing (AP) and resistance (AR) may influence severity of illness in urinary tract infection (UTI). Limited data exist assessing the relationship between county-level AP and AR on initial presentation to hospital for UTI. This study evaluated the association between county-level AP and AR on UTI severity of illness among hospitalized patients in New York State.

**Methods.** Retrospective, cross-sectional analysis, combining data from New York State Statewide Planning and Research Cooperative System (SPARCS) and previously published data on countywide antimicrobial resistance and antimicrobial prescribing. Inclusion criteria: female patients admitted to a New York inpatient setting in 2017, UTI (CCS 159), Medicare insurance. Exclusion criteria: missing countywide prescribing or resistance. All-patient refined (APR) clinical severity  $\geq 3$  was the primary outcome. Counties were classified as prescribing above or below the median prescribing proportion, and above or below the median prevalence of *E. coli* resistance for TMP-SMX and NTF. Countywide prescribing practices, antimicrobial resistance, patient factors, and location factors were evaluated for association with APR clinical severity  $\geq 3$  using chi-squared and logistic regression.

**Results.** 8,024 patients met study criteria. Baseline characteristics are presented in Table 1. 3,597 (44.8%) had an APR severity of  $\geq 3$ . Factors associated with APR severity  $\geq 3$  include age group ( $P < 0.001$ ), ethnicity ( $P = 0.013$ ), hospital county ( $P < 0.001$ ), first line prescribing  $\geq 45.4\%$  ( $P = 0.049$ ), *E. coli* TMP-SMX resistance  $\geq 29.0\%$  ( $P < 0.001$ ) via chi-squared test. In the logistic regression analysis counties with higher first line prescribing was associated with decreased odds for severe infection (aOR: 0.83 [0.72 - 0.97]). Additional factors associated with severe infection are presented in Table 2.

Table 1: Baseline Characteristics

	N (%)
Age Group	
50 to 69	1227 (15.3)
70 or Older	6797 (84.7)
White	4950 (61.7)
Hispanic, Multi-Racial, or Other	1605 (20.0)
County	
Albany	383 (4.8)
Bronx	886 (11)
Dutchess	274 (3.4)
Fulton	22 (0.3)
Kings	1259 (15.7)
Manhattan	1301 (16.2)
Orange	273 (3.4)
Putnam	81 (1)
Queens	1257 (15.7)
Richmond	376 (4.7)
Rockland	254 (3.2)
Suffolk	1459 (18.2)
Sullivan	55 (0.7)
Ulster	144 (1.8)
First line Prescribing $\geq 45.4\%$	3290 (41.0)
<i>E. coli</i> resistance to TMP-SMX $\geq 29.0\%$	3402 (42.4)
<i>E. coli</i> resistance to NTF $\geq 2.0\%$	5989 (74.6)
APR severity $\geq 3$	3597 (44.8)

Abbreviations: TMP-SMX: Trimethoprim-Sulfamethoxazole; NTF: Nitrofurantoin; APR: All-patient refined;

Table 2: Factors Associated with APR Severity

	P	aOR	95% C.I. aOR	
			Lower	Upper
Age $\geq 70$	< .001	1.382	1.220	1.567
First line prescribing $\geq 45.4\%$	.017	.832	.716	.968
County Group*	< .001	1.325	1.133	1.550
<i>E. coli</i> TMP-SMX resistance $\geq 29.0\%$	< .001	.801	.712	.901
<i>E. coli</i> NTF resistance $\geq 2.0\%$	.081	1.122	.986	1.278
Hispanic	.042	.888	.792	.996

\*County group: Albany, Bronx, Dutchess, Fulton, Manhattan, Orange, Putnam, and Sullivan County.

**Conclusion.** Prescribing patterns may have a significant influence on initial presentation to the hospital for urinary tract infections. Outpatient antimicrobial stewardship should endeavor to promote guideline driven prescribing. Further research is needed to corroborate the findings from this cross-sectional study.

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### 152. Use of Antimicrobials among Suspected COVID-19 Patients at Selected 12 Hospitals in Bangladesh: Findings from the First Wave of COVID-19 Pandemic

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**Session:** P-09. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

**Background.** Antimicrobials are empirically used in COVID-19 patients resulting in inappropriate stewardship and increased antimicrobial resistance. Our objective was to assess antimicrobial use among suspected COVID-19 in-patients while waiting for the COVID-19 test report.

**Methods.** From March to August 2020, we collected data from in-patients of 12 tertiary-level hospitals across Bangladesh. We identified suspected COVID-19 patients; collected information on antimicrobial received within 24 h before and on hospitalization; and tested nasopharyngeal swab for SARS-CoV-2 using rRT-PCR. We used descriptive statistics and a regression model for data analysis.

**Results.** Among 1188 suspected COVID-19 patients, the median age was 34 years (IQR:2-56), 69% were male, 40% had comorbidities, 53% required oxygen, and 1% required ICU or ventilation support after admission. Antibiotics were used in 92% of patients, 47% within 24 h before, and 89% on admission. Patients also received antiviral, mostly favipiravir (1%) and antiparasitic drugs particularly ivermectin (3%). Third-generation cephalosporin use was the highest (708;60%), followed by macrolide (481;40%), and the majority (853;78%) who took antibiotics were SARS-CoV-2 negative. On admission, 77% mild and 94% moderately ill patients received antibiotics. Before admission, 3% patients had two antibiotics, and on admission, 27% received two to four classes of antibiotics at the same time. According to WHO AWaRe classification, the Watch group antibiotics were mostly used before (43%) as well as on admission (80%). Reserve group antibiotic particularly linezolid was used in 1% patients includes mild cases on admission. Antibiotic use on admission was higher among