



# Outpatient Antibiotic Stewardship in the COVID pandemic: Trends in antibiotic prescription in a statewide Veteran's Affairs health care system

Alissa Werzen, Rohini Davé, Rohit Talwani, Jacqueline T Bork  
 Veterans Affairs Maryland Health Care System, Baltimore Maryland;  
 University of Maryland School of Medicine, Baltimore, Maryland



## BACKGROUND

- Outpatient antibiotic stewardship is an emerging area of interest
- Outpatient antibiotic stewardship has been recognized as a national priority in the combat of antimicrobial resistance
- In the outpatient setting, it is estimated that antibiotics are inappropriately prescribed 30% of the time
- The COVID-19 pandemic has led to fundamental changes in the provision of outpatient care, as many primary care and subspecialist visits have been transitioned to telemedicine
- The impact of telemedicine on outpatient antibiotic stewardship has been previously investigated, with conflicting results noted

## METHODS

- Interrupted time series (ITS) analysis was conducted pre (1/5/2020 – 3/14/2020; weeks 2-11) and immediately post (3/15/2020 – 5/31/2020, weeks 12-17) COVID-19 restrictions at the VA Maryland Health Care System
- COVID-19 restrictions (shift towards telemedicine visits and closing of clinics, postponing surgeries, social distancing) occurred week 12
- Antimicrobials per encounters were compared pre post; and control group from 2019 was used
- Specific characteristics which were compared included antibiotic type, prescriber service, setting (rural/suburban vs urban), refill, delivery type (mail vs window) and duration
- Prescribing characteristics were compared using Chi-squared and Mann Whitney U tests
- Segmented linear regression was used to compare antimicrobial prescriptions per encounters
- Quarterly total antimicrobial data was also compared between fiscal year (FY) 2019 and FY 2020
- Rate difference was compared using Poisson regression

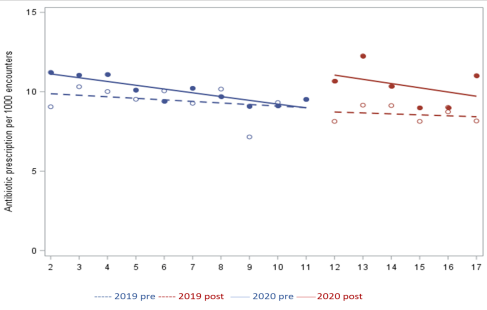
## OBJECTIVE: To investigate outpatient antibiotic use trends pre and post COVID-19 restrictions at a statewide Veteran's Affairs Health Care System in Maryland

## RESULTS

Table 1. Antibiotic and prescriber characteristics Pre and Post COVID-19 restrictions in January to May 2020, with control group January to May 2019

Antibiotic Type	2019 (control group) N (%) or mean (sd) <sup>1</sup>		p-value	2020 ("experimental" group) N (%) or mean (sd)		p-value
	Pre	Post		Pre	Post	
Macrolides	370 (12.8)	189 (11.4)	0.17	502 (16.9)	101 (11.2)	<0.0001
Tetracyclines	511 (11.3)	283 (17.1)	0.62	561 (18.8)	152 (16.9)	0.18
Amox-clav <sup>2</sup>	364 (12.6)	189 (11.4)	0.24	327 (10.9)	113 (12.5)	0.20
Amoxicillin	329 (11.4)	182 (11.0)	0.69	258 (8.7)	66(7.3)	0.2
Fluoroquinolone	272 (9.4)	172 (10.4)	0.29	222 (7.5)	70 (7.8)	0.76
TMP-SMX <sup>3</sup>	198 (6.9)	130 (7.9)	0.21	189 (6.3)	83 (9.2)	0.003
<b>Service</b>						
Primary care	580 (20.1)	302 (18.2)	0.13	543 (18.2)	201 (22.3)	0.007
Emergency	502 (17.4)	292 (17.6)	0.82	527 (17.7)	172 (19.1)	0.35
Urgent Care	285 (9.9)	146 (8.8)	0.25	279 (9.4)	46 (5.1)	<0.0001
Discharge	194 (6.7)	134 (8.1)	0.08	226 (7.6)	60 (6.7)	0.35
Urology	122 (4.2)	70 (4.2)	0.99	91 (3.1)	22 (2.4)	0.33
Podiatry	105 (3.6)	57 (3.4)	0.73	77 (2.6)	25 (2.8)	0.76
<b>Clinic Setting</b>						
Suburban/rural	760 (27.3)	477 (30.1)	0.05	842 (29.9)	241 (28.3)	0.37
Refill prescription	61 (2.1)	30 (1.8)	0.49	152 (5.1)	21 (2.3)	0.0004
Mail prescription	676 (23.4)	422 (25.5)	0.11	818 (27.5)	390 (43.2)	<0.0001
Duration >14 days	424 (14.7)	255 (15.4)	0.51	527 (17.7)	151 (16.7)	0.51

Figure 1. Antibiotic prescription per 1000 encounters Pre and Post COVID 19 restrictions in January to May 2020, with control group January to May 2019.



Per weekly ITS analysis, there was a significant decrease in encounters and antibiotics per week post COVID-19 restrictions, with mean difference of -15241 encounters and -147 antibiotics, respectively.

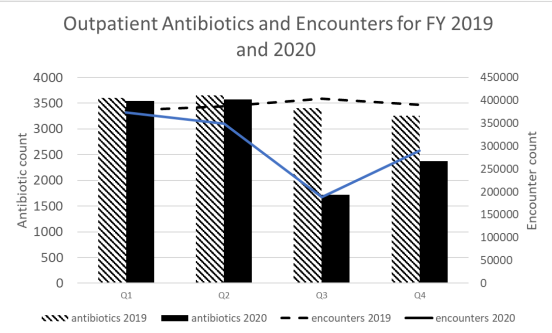


Figure 2. Trends in outpatient antibiotics and encounters for FY 2019 and 2020

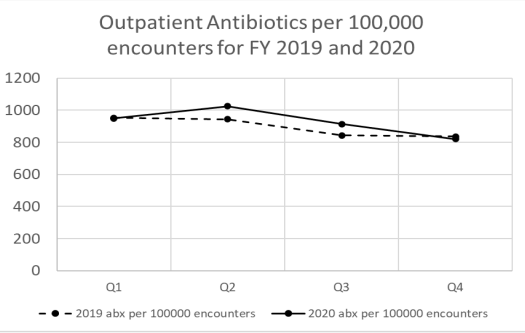


Figure 3. Quarterly rate of outpatient antibiotics per 100,000 for FY 2019 and 2020.

## RESULTS continued

- There was a significant change of +2.7 antibiotics per 1000 encounters (p = 0.02) immediately after restrictions were placed; this change was not seen in 2019
- Proportion of trimethoprim-sulfamethoxazole prescription increased with a reciprocal decrease in macrolide use
- Proportion of antibiotic prescription in the primary care setting was noted to increase, while the proportion of prescription in the urgent care clinic decreased
- In addition, mail prescriptions were more common and refills occurred less often post COVID-19 restrictions
- For Quarterly analysis: Q3 and Q4 of FY2020 demonstrated decreases in both antibiotic prescription and encounters
- However, the rate difference between 2019 and 2020 was +143.4 antibiotics per 100,000 encounters (p < 0.001, lower limit 108.7, upper limit 178.0)

## DISCUSSION

- Rate of outpatient antibiotic prescription per encounter increased immediately after COVID-19 restrictions were placed
- Although antibiotic prescription decreased overall, there was an appreciable increase in antibiotics relative to encounters
  - Whether this was artificially increased due to small number of encounters overall (i.e. lack of routine visits which normally would not require antibiotic prescription) versus inappropriate prescription (i.e. due to virtual visits) needs further evaluation
- Understanding the potential gaps in this metric and/or prescribing practices during virtual visits has important implications for outpatient antibiotic stewardship efforts

## References

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