

In Outpatient Clinics Serving Veterans, Antibiotic Prescriptions Precede a Minority of Antibiotic-Associated Adverse Events



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Background

- An estimated 30% of antibiotic prescriptions in outpatient settings may be inappropriate.
- Antibiotic exposure increases an individual's risk of *Clostridioides difficile* infection (CDI) and acquiring drug-resistant pathogens.
- The risk of acquiring CDI or drug-resistant pathogens following an outpatient antibiotic exposure is not well characterized.

Objective

- To describe the frequency of antibiotic-associated adverse events in an outpatient population and the relative risk of adverse events following antibiotic prescriptions.

Methods

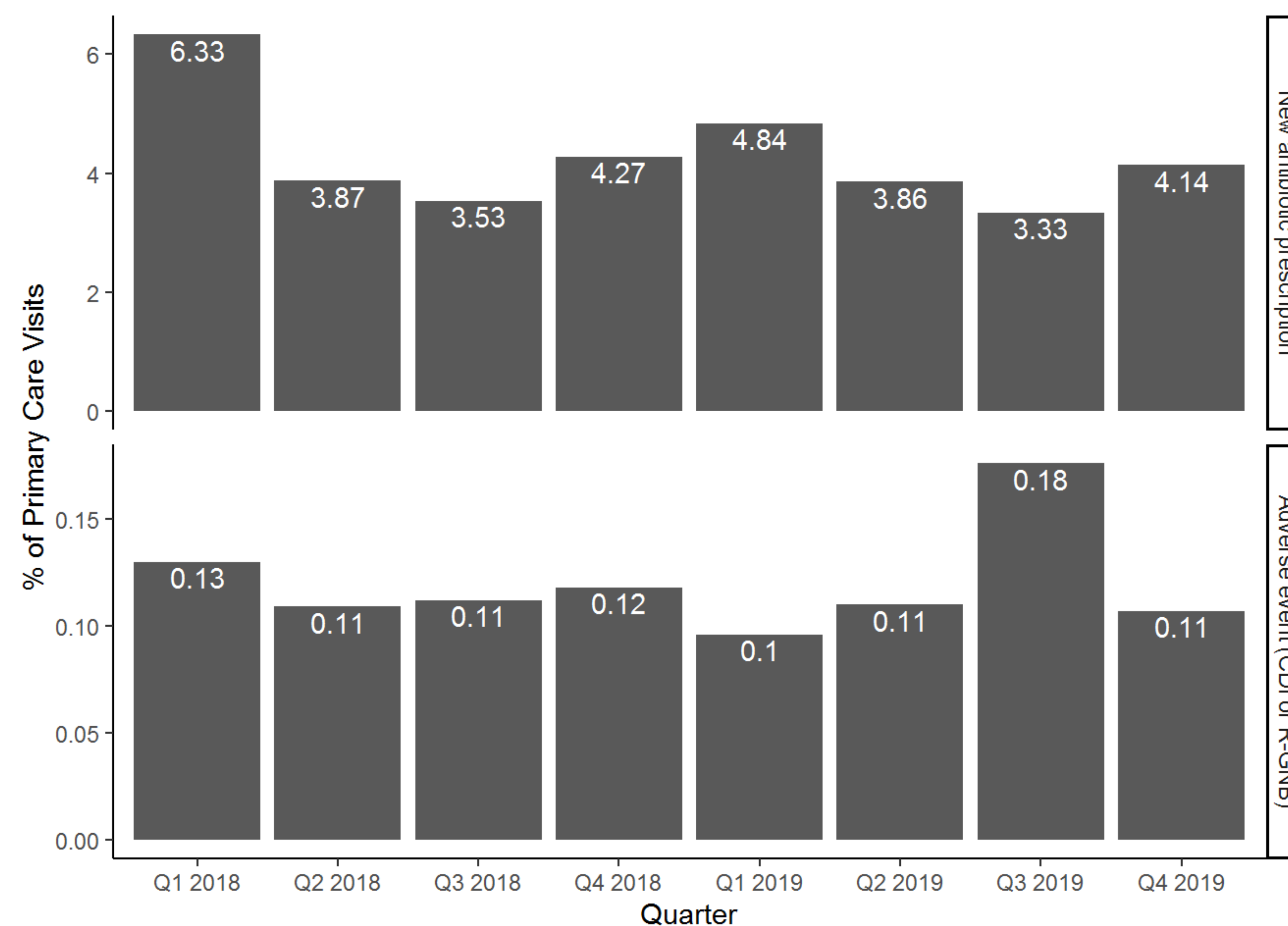
- We examined a 2-year cohort of patients seen in primary care clinics at VA Community-Based Outpatient Clinics (CBOC) associated with a large VA Medical Center
- We defined antibiotic-associated adverse events (AEs) as community-acquired CDI or community acquisition of new resistant Gram-negative bacteria (R-GNB) (Gram-negative organism with reported resistance beyond that inherent to the organism)
- Among patients with an in-person visit at 13 CBOCs in 2018-2019, we examined rates of AEs in the 90 days following visits among visits separated by 90+ days
- For each visit, we used administrative databases to determine if systemic antibiotics were prescribed, if there was an associated infectious diagnosis, and the subsequent occurrence of AEs
- We summarized quarterly rates of prescribed antibiotics and AEs, then characterized patients with and without AEs
- We estimated the risk ratio of AE associated with an antibiotic prescription

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Patient Characteristics and Indications for Antibiotic Prescriptions

Characteristics	All Outpatient Visits (N = 236665)	No Antibiotic-Associated Adverse Event (N = 236382)	Community-Associated Resistant Gram-Negative Bacteria (N = 225)	Community-Associated <i>C. difficile</i> infection (N = 62)
Patients				
No. unique patients	85393	85369	225	58
Age at first visit (± SD)	66.7 ± 14.7	66.7 ± 14.8	71.3 ± 10.4	66.6 ± 10.5
Male, n (%)	222492 (94%)	222229 (94%)	208 (92%)	58 (94%)
Charlson Comorbidity Index at first visit (± SD)	0.72 ± 1.3	0.72 ± 1.3	2.68 ± 2.7	3.6 ± 3.0
Outpatient Visit				
Antibiotic prescription, n (% of visits)	10177 (4%)	10148 (4%)	23 (10%)	6 (10%)
Acute respiratory infection	5090 (2%)	5082 (2%)	5 (2%)	3 (5%)
Skin and soft tissue infection	646 (0%)	639 (0%)	6 (3%)	1 (2%)
Urinary tract infection	583 (0%)	579 (0%)	4 (2%)	0 (0%)
Pneumonia or Influenza	562 (0%)	558 (0%)	3 (1%)	1 (2%)

Proportion of Visits with an Antibiotic Prescription (upper panel) or Adverse Event (lower panel)



Results

- Following 236,665 outpatient visits, we observed 62 and 225 AEs due to CDI and R-GNB, respectively
- Patients with CDI or R-GNB had higher Charlson Comorbidity Index (3.6 ± 3.0 and 2.68 ± 2.7, respectively) than those without AEs (0.72 ± 1.3; Table).
- The rate of new antibiotic prescriptions was 4% in visits without and 10% in visits with subsequent AE; the most common agent prescribed overall and among AE was doxycycline
- The risk ratio for AE associated with an antibiotic prescription was 2.5 (95% CI: 1.7-3.7, p < 0.01)

Conclusions

- Among patients with a primary care visit between 2018-2019, an AE, defined as community-acquired CDI or R-GNB acquisition, was observed following 0.1% of visits.
- Among patients who experienced an AE, only 10% of primary care outpatient visits preceding those events included a new antibiotic prescription.
- Among Veterans, outpatient antibiotic exposure may have only a modest contribution to the risk of AE.

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