Outpatient Antibiotic Prescriptions

United States, 2019

Introduction

Tracking national antibiotic use is an essential public health surveillance activity that allows CDC and its partners to identify opportunities to improve prescribing practices. CDC monitors outpatient antibiotic prescription data to inform antibiotic stewardship priorities and measure progress over time to promote equitable access to quality healthcare and optimize patient safety.

Data Sources

Systemic oral antibiotics were extracted from the IQVIA Xponent® database.[1] IQVIA captured an estimated 92% of outpatient prescriptions dispensed from retail pharmacies for any medication nationally, reconciled them to wholesale deliveries to these pharmacies, and projected to 100% coverage. These data represent all outpatient antibiotic prescriptions from community pharmacies from all payers but exclude federal facilities. Healthcare provider specialties are based on the American Medical Association (AMA) self-designated practice specialties, Drug Enforcement Administration (DEA), and National Provider Identifier (NPI) sources and categorized into one of 17 groups. Provider specialty denominators are estimated by extracting the total number of providers in each provider specialty from the IQVIA Xponent® prescription database. Rates are calculated using provider specialty denominators for 2011 aggregated by IQVIA. Yearly antibiotic prescription rates per 1,000 persons by age, sex, and region are calculated using annual U.S. Census files.

Note: Starting in 2017, enhancements to IQVIA's methodology also take into account that some prescriptions which are ordered may not be picked up by the patient and that patients may not pay for their prescriptions in the way that the pharmacy expects, leading to prescriptions that are ultimately not dispensed. The previous methodology did not account for the return or restocking of these prescriptions filled, but not picked up by patients. Accounting for these situations, which can lead to overstated prescriptions, likely makes the revised methodology data more accurate.

TOTAL OUTPATIENT ORAL ANTIBIOTIC PRESCRIPTIONS IN 2019

251.1 million total oral antibiotic prescriptions, at a rate of 765 prescriptions per 1,000 persons

Table 1. Oral antibiotic prescriptions by age, sex, and region – United States, 2019

Characteristics	Number of Antibiotic Prescriptions (Millions)[a]	Antibiotic Prescriptions Per 1,000 Persons, Rate[b]
Age Group		
<20 years	55.8	684
≥20 years	194.9	790
Sex		
Female	152.9	918
Male	98.0	606
Region		
Northeast	45.1	806
Midwest	53.8	788
South	108.9	867
West	43.0	549

a. Totals may not add to all oral prescriptions (251.1 million) due to missing data.
b. Rates were calculated using population data obtained from the 2019 U.S. Census.

Table 2. Top oral antibiotic classes and agents – United States, 2019

Characteristics	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Antibiotic Class		
Penicillins	58.8	179
Macrolides	39.8	121
Cephalosporins	37.1	113
B-lactams, increased activity	28.4	87
Tetracyclines	24.9	76
Antibiotic Agent		
Amoxicillin	54.1	165
Azithromycin	37.9	115
Amoxicillin-clavulanic avid	28.4	87
Cephalexin	21.7	66
Doxycycline	21.3	65

a. Rates were calculated using population data obtained from the 2019 U.S. Census.

Table 3. Oral antibiotic prescribing by specialty – United States, 2019

Specialty	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate[a]
Primary Care Physicians	86.0	362
Physician Assistants & Nurse Practitioners	80.8	467
Surgical Specialties	17.2	192
Dentistry	24.7	201
Emergency Medicine	12.5	386
Dermatology	5.8	514
Obstetrics/Gynecology	4.9	130
Other	19.2	92
All Healthcare Professionals	251.1	275

a. Rates were calculated using provider specialty denominators for 2011 aggregated by IQVIA.

Figure 1. Antibiotic prescriptions per 1,000 persons by state (sextiles) for all ages – United States, 2019

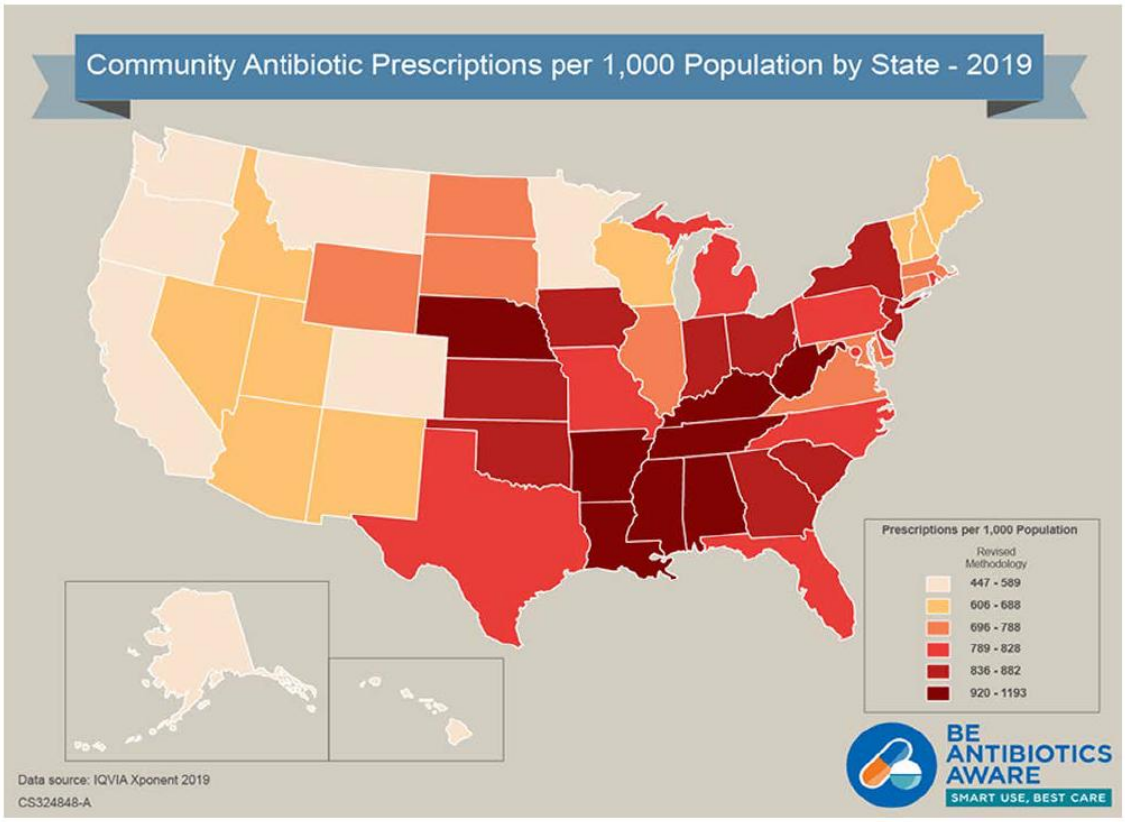

Table 4. Oral antibiotic prescribing by state – United States, 2019

State	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Alabama	1108
Alaska	447
Arizona	670
Arkansas	1028
California	519
Colorado	513
Connecticut	788
Delaware	794
District of Columbia	798
Florida	795
Georgia	836
Hawaii	569
Idaho	625
Illinois	754
Indiana	855
Iowa	861
Kansas	882
Kentucky	1143
Louisiana	1110
Maine	679
Maryland	710
Massachusetts	696
Michigan	816

Minnesota	581
Mississippi	1130
Missouri	798
Montana	589
Nebraska	920
Nevada	654
New Hampshire	688
New Jersey	844
New Mexico	640
New York	853
North Carolina	789
North Dakota	696
Ohio	882
Oklahoma	843
Oregon	491
Pennsylvania	806
Rhode Island	828
South Carolina	874
South Dakota	773
Tennessee	1046
Texas	805
Utah	663
Vermont	606
Virginia	751
Washington	507
West Virginia	1193
Wisconsin	621
Wyoming	738

a. Rates were calculated using population data obtained from the 2019 U.S. Census.

Suggested Citation: Centers for Disease Control and Prevention. Outpatient antibiotic prescriptions — United States, 2019.

References

1. Hicks LA, Bartoces MG, Roberts RM, Suda KJ, Hunkler RJ, Taylor TH Jr, Schrag SJ. US outpatient antibiotic prescribing variation according to geography, patient population, and provider specialty in 2011. Clin Infect Dis. 2015 May 1;60(9):1308-16. doi: 10.1093/cid/civ076. Epub 2015 Mar 5. PMID: 25747410.