Outpatient Antibiotic Prescriptions

United States, 2020

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 2020

201.9 million total oral antibiotic prescriptions, at a rate of 613 prescriptions per 1,000 persons

Table 1. Oral antibiotic prescriptions by age, sex, and region – United States, 2020

Characteristics	Number of Antibiotic Prescriptions (Millions)[a]	Antibiotic Prescriptions Per 1,000 Persons, Rate[b]
Age Group		
<20 years	48.5	410
≥20 years	187.6	678
Sex		
Female	125.0	747
Male	76.8	473
Region		
Northeast	35.5	636
Midwest	42.8	627
South	88.5	698
West	34.9	444

a. Totals may not add to all oral prescriptions (201.9 million) due to missing data.
b. Rates were calculated using population data obtained from the 2020 U.S. Census.

Table 2. Top oral antibiotic classes and agents – United States, 2020

Characteristics	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Antibiotic Class		
Penicillins	43.2	131
Cephalosporins	30.2	92
Macrolides	29.0	88
Tetracyclines	22.7	69
B-lactams, increased activity	21.0	64
Antibiotic Agent		
Amoxicillin	39.3	119
Azithromycin	27.6	84
Amoxicillin-clavulanic avid	21.0	64
Cephalexin	19.6	60
Doxycycline	19.5	59

a. Rates were calculated using population data obtained from the 2020 U.S. Census.

Table 3. Oral antibiotic prescribing by specialty – United States, 2020

Specialty	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate[a]
Primary Care Physicians	64.1	270
Physician Assistants & Nurse Practitioners	62.3	360
Surgical Specialties	15.3	172
Dentistry	23.4	191
Emergency Medicine	9.5	295
Dermatology	5.6	496
Obstetrics/Gynecology	4.6	123
Other	17.0	82
All Healthcare Professionals	201.9	221

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, 2020

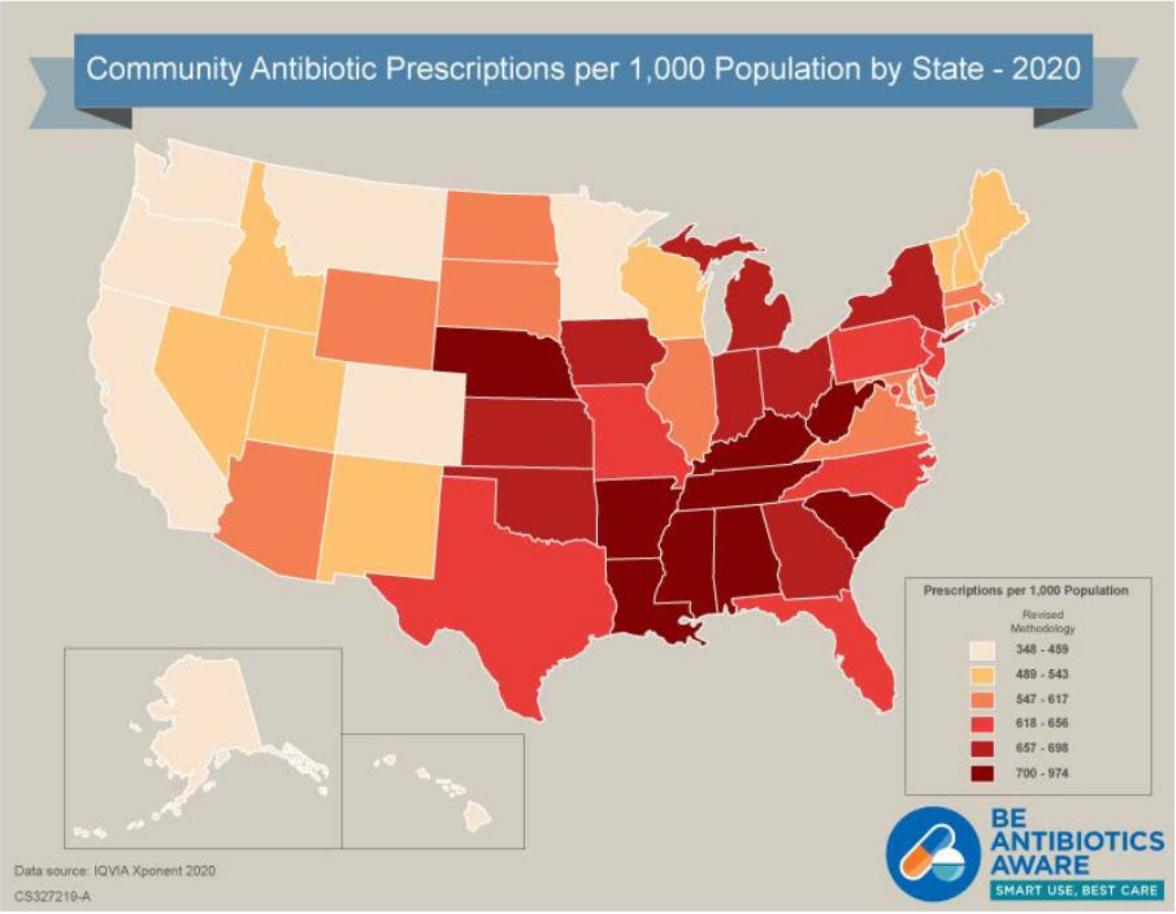

Table 4. Oral antibiotic prescribing by state – United States, 2020

State	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Alabama	922
Alaska	348
Arizona	547
Arkansas	844
California	421
Colorado	418
Connecticut	617
Delaware	618
District of Columbia	627
Florida	656
Georgia	682
Hawaii	420
Idaho	506
Illinois	606
Indiana	680
Iowa	665
Kansas	690
Kentucky	887
Louisiana	920

Maine	517
Maryland	562
Massachusetts	548
Michigan	657
Minnesota	455
Mississippi	956
Missouri	644
Montana	459
Nebraska	718
Nevada	538
New Hampshire	543
New Jersey	656
New Mexico	519
New York	675
North Carolina	625
North Dakota	547
Ohio	698
Oklahoma	675
Oregon	398
Pennsylvania	647
Rhode Island	635
South Carolina	700
South Dakota	612
Tennessee	842
Texas	637
Utah	541
Vermont	489
Virginia	591
Washington	397
West Virginia	974
Wisconsin	498
Wyoming	586

a. Rates were calculated using population data obtained from the 2020 U.S. Census.

Suggested Citation: Centers for Disease Control and Prevention. Outpatient antibiotic prescriptions — United States, 2020.

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.