

Outpatient Antibiotic Prescriptions

United States, 2021

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 93% 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 2021

211.1 million total oral antibiotic prescriptions, at a rate of 636 prescriptions per 1,000 persons



Table 1. Oral antibiotic prescriptions by age, sex, and region – United States, 2021

Characteristics	Number of Antibiotic Prescriptions (Millions) ^a	Antibiotic Prescriptions Per 1,000 Persons, Rate ^b
Age Group		
<20 years	37.2	452
≥20 years	173.7	695
Sex		
Female	130.1	777
Male	80.7	491
Region		
Northeast	35.8	627
Midwest	44.3	643
South	96.1	756
West	34.7	441

a. Totals may not add to all oral prescriptions (211.1 million) due to missing data.

b. Rates were calculated using population data obtained from the 2021 U.S. Census.

Table 2. Top oral antibiotic classes and agents – United States, 2021

Characteristics	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate ^a
Antibiotic Class		
Penicillins	46.4	140
Cephalosporins	31.4	95
Macrolides	29.9	90
Tetracyclines	25.0	75
B-lactams, increased activity	22.6	68
Antibiotic Agent		
Amoxicillin	42.9	129
Azithromycin	28.7	86
Amoxicillin-clavulanic acid	22.6	68
Doxycycline	21.7	65
Cephalexin	20.5	62

a. Rates were calculated using population data obtained from the 2021 U.S. Census.

Table 3. Oral antibiotic prescribing by specialty – United States, 2021

Specialty	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate ^a
Primary Care Physicians	61.2	258
Physician Assistants & Nurse Practitioners	69.8	403
Surgical Specialties	16.3	183
Dentistry	25.5	208
Emergency Medicine	10.7	332
Dermatology	5.7	505
Obstetrics/Gynecology	4.6	122
Other	17.1	82
All Healthcare Professionals	211.1	231

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, 2021

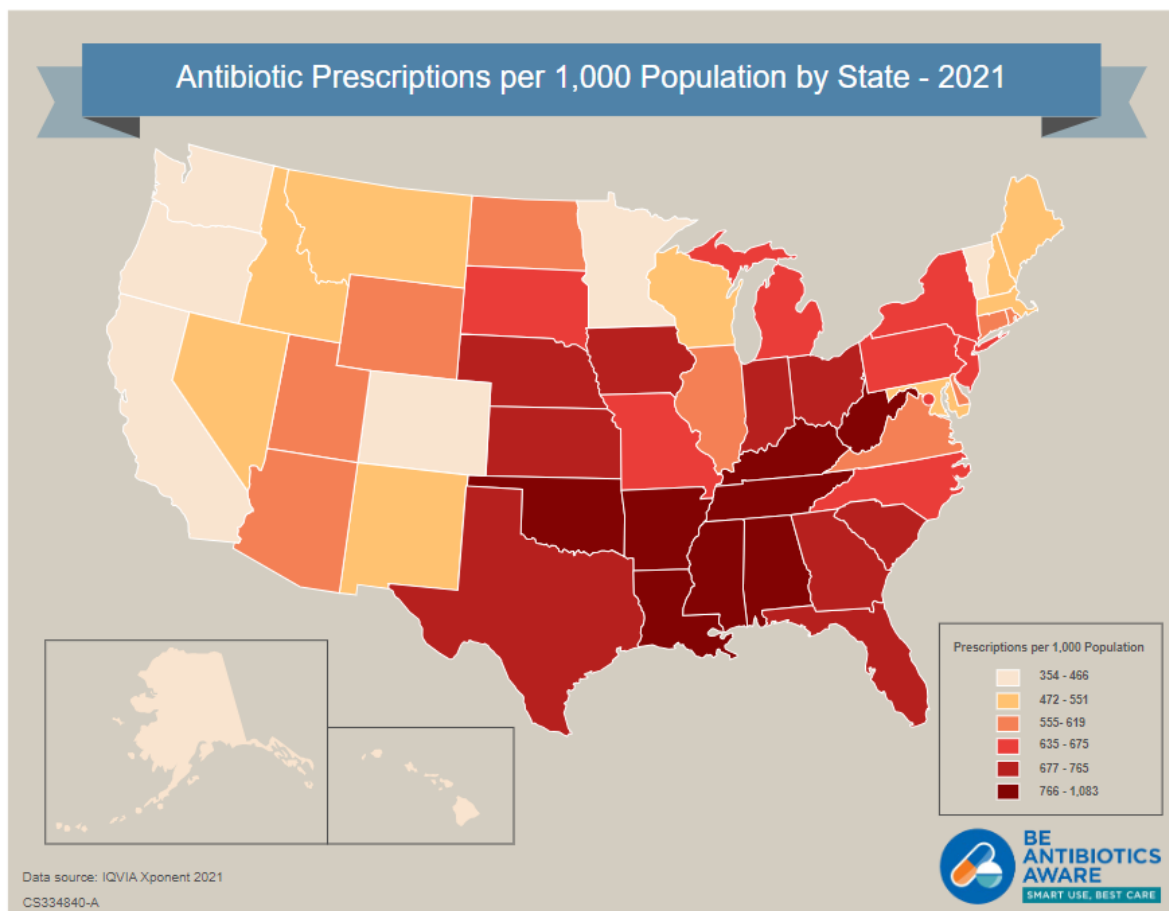


Table 4. Oral antibiotic prescribing by state – United States, 2021

State	Antibiotic Prescriptions Per 1,000 Persons, Rate ^a
Alabama	985
Alaska	354
Arizona	566
Arkansas	927
California	411
Colorado	425
Connecticut	605
Delaware	619
District of Columbia	673
Florida	721
Georgia	749
Hawaii	392
Idaho	514
Illinois	604
Indiana	701
Iowa	677
Kansas	724
Kentucky	938
Louisiana	1015
Maine	508
Maryland	551
Massachusetts	545

Michigan	675
Minnesota	466
Mississippi	1083
Missouri	675
Montana	472
Nebraska	760
Nevada	540
New Hampshire	538
New Jersey	635
New Mexico	530
New York	666
North Carolina	644
North Dakota	581
Ohio	718
Oklahoma	766
Oregon	387
Pennsylvania	643
Rhode Island	600
South Carolina	765
South Dakota	670
Tennessee	904
Texas	708
Utah	555
Vermont	460
Virginia	592
Washington	389
West Virginia	1022
Wisconsin	502
Wyoming	619

a. Rates were calculated using population data obtained from the 2021 U.S. Census.

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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.