Outpatient Antibiotic Prescriptions

United States, 2016

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 88% 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: Methodology for estimating prescriptions for years 2011-2016 does not account for the return or restocking of prescriptions filled, but not picked up by patients. These situations can lead to overstated prescriptions. 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.

TOTAL OUTPATIENT ORAL ANTIBIOTIC PRESCRIPTIONS IN 2016

270.2 million total oral antibiotic prescriptions, at a rate of 836 prescriptions per 1,000 persons

Table 1. Oral antibiotic prescriptions by age, sex, and region – United States, 2016

Characteristics	Number of Antibiotic Prescriptions (Millions)[a]	Antibiotic Prescriptions Per 1,000 Persons, Rate[b]
Age Group		
<20 years	64.9	790
≥20 years	205.4	852
Sex		
Female	164.6	1,003
Male	105.5	663
Region		
Northeast	48.8	868
Midwest	60.2	887
South	114.7	937
West	46.5	607

a. Totals may not add to all oral prescriptions (270.2 million) due to missing data.

b. Rates were calculated using population data obtained from the 2016 U.S. Census.

Table 2. Top oral antibiotic classes and agents – United States, 2016

Characteristics	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Antibiotic Class		
Penicillins	63.2	196
Macrolides	47.7	148
Cephalosporins	36.9	114
Fluoroquinolones	29.7	92
B-lactams, increased activity	26.4	82
Antibiotic Agent		
Amoxicillin	56.7	176
Azithromycin	44.9	139
Amoxicillin-clavulanic avid	26.4	82
Cephalexin	21.8	68
Sulfamethoxazole-trimethoprim	20.0	62

a. Rates were calculated using population data obtained from the 2016 U.S. Census.

Table 3. Oral antibiotic prescribing by specialty – United States, 2016

Specialty	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate[a]
Primary Care Physicians	106.3	448
Physician Assistants & Nurse Practitioners	68.4	395
Surgical Specialties	19.3	217
Dentistry	25.7	210
Emergency Medicine	14.7	454
Dermatology	6.9	608
Obstetrics/Gynecology	6.0	160
Other	22.9	110
All Healthcare Professionals	270.2	296

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, 2016

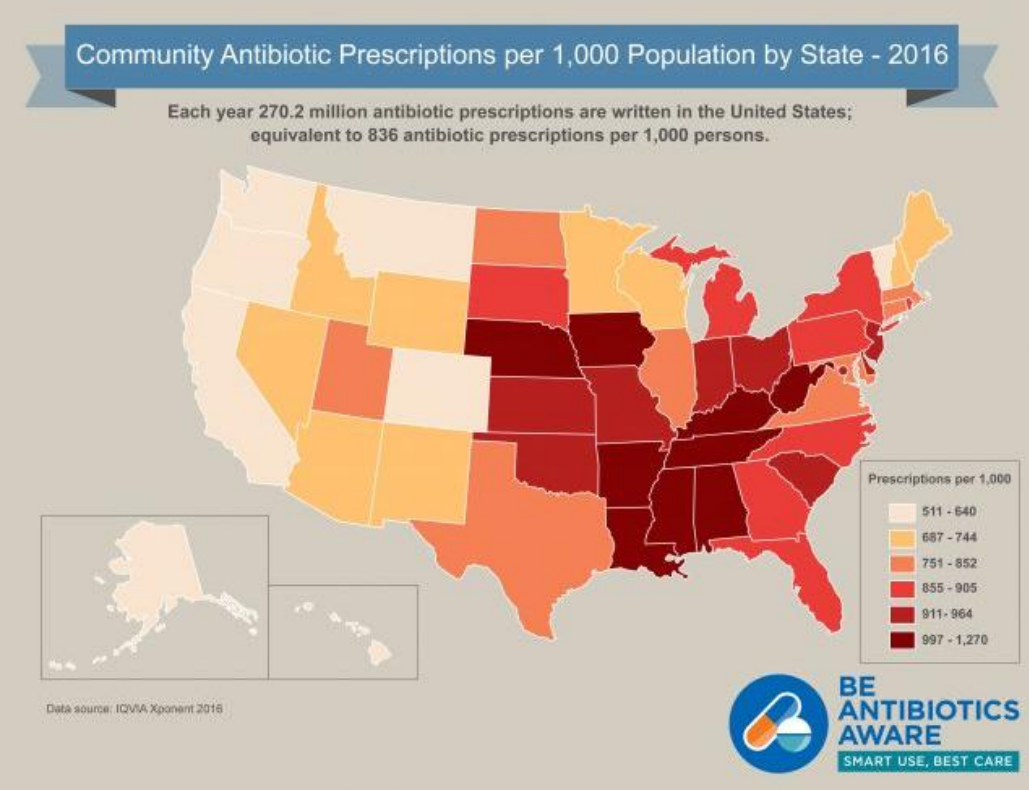

Table 4. Oral antibiotic prescribing by state – United States, 2016

State	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
Alabama	1,188
Alaska	511
Arizona	744
Arkansas	1,131
California	567
Colorado	585
Connecticut	841
Delaware	929
District of Columbia	936
Florida	855
Georgia	898
Hawaii	615
Idaho	689
Illinois	844
Indiana	963
Iowa	997
Kansas	964
Kentucky	1,270
Louisiana	1,193
Maine	707
Maryland	784
Massachusetts	751
Michigan	899
Minnesota	687
Mississippi	1,235

Missouri	924
Montana	631
Nebraska	1,040
Nevada	721
New Hampshire	716
New Jersey	911
New Mexico	704
New York	905
North Carolina	856
North Dakota	797
Ohio	963
Oklahoma	911
Oregon	547
Pennsylvania	895
Rhode Island	885
South Carolina	957
South Dakota	900
Tennessee	1,169
Texas	852
Utah	753
Vermont	640
Virginia	790
Washington	580
West Virginia	1,257
Wisconsin	733
Wyoming	744

a. Rates were calculated using population data obtained from the 2016 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.