Outpatient Antibiotic Prescriptions

United States, 2018

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. However, for comparisons to previous years of estimates the previous methodology data should be used.

TOTAL OUTPATIENT ORAL ANTIBIOTIC PRESCRIPTIONS IN 2018

Previous Methodology: 258.9 million total oral antibiotic prescriptions, at a rate of 791 prescriptions per 1,000 persons

Revised Methodology: 249.8 million total oral antibiotic prescriptions, at a rate of 763 prescriptions per 1,000 persons

Table 1. Oral antibiotic prescriptions by age, sex, and region – United States, 2018

Characteristics	Number of Antibiotic Prescriptions (Millions)[a]	Antibiotic Prescriptions Per 1,000 Persons, Rate[b]	Number of Antibiotic Prescriptions (Millions)[a]	Antibiotic Prescriptions Per 1,000 Persons, Rate[b]
	Previous methodology[c]		Revised methodology[d]	
Age Group				
<20 years	58.2	710	56.2	686
≥20 years	200.7	818	193.2	788
Sex				
Female	157.9	951	152.1	916
Male	100.9	626	97.4	604
Region				
Northeast	55.8	817	53.8	788
Midwest	47.1	839	45.3	808
South	111.6	895	107.7	863
West	44.4	569	42.9	550

a. Totals may not add to all oral prescriptions due to missing data.
b. Rates were calculated using population data obtained from the 2018 U.S. Census.
c. Estimates created using previous IQVIA methodology.
d. Estimates created using data from revised methodology accounting for reversed and voided prescriptions across weeks.

Table 2. Top oral antibiotic classes and agents – United States, 2018

Characteristics	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]
	Previous methodology[b]		Revised methodology[c]	
Antibiotic Class				
Penicillins	60.6	185	59.0	180
Macrolides	41.9	128	40.5	124
Cephalosporins	37.2	114	35.9	110
B-lactams, increased activity	27.5	84	26.6	81
Tetracyclines	24.3	74	23.0	70
Antibiotic Agent				
Amoxicillin	55.3	169	53.8	164
Azithromycin	39.7	121	38.5	118
Amoxicillin-clavulanic acid	27.5	84	26.6	81
Cephalexin	22.2	68	21.4	65
Doxycycline	20.2	62	19.2	59

a. Rates were calculated using population data obtained from the 2018 U.S. Census.
b. Estimates created using previous IQVIA methodology.
c. Estimates created using data from revised methodology accounting for reversed and voided prescriptions across weeks.

Table 3. Oral antibiotic prescribing by specialty – United States, 2018

Specialty	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate[a]	Number of Antibiotic Prescriptions (Millions)	Antibiotic Prescriptions Per Provider, Rate[a]
	Previous methodology[b]		Revised methodology[c]	
Primary Care Physicians	92.5	389	89.3	376
Physician Assistants and Nurse Practitioners	76.5	442	73.3	423
Surgical Specialties	18.2	204	17.5	196
Dentistry	25.4	207	24.7	201
Emergency Medicine	13.1	404	12.7	392
Dermatology	6.3	555	5.9	525
Obstetrics/Gynecology	5.4	145	5.1	137
Other	21.5	103	21.2	102
All Providers	258.9	284	249.8	274

a. Rates were calculated using provider specialty denominators for 2011 aggregated by IQVIA.
b. Estimates created using previous IQVIA methodology.
c. Estimates created using data from revised methodology accounting for reversed and voided prescriptions across weeks.

Figure 1. Antibiotic prescriptions per 1,000 persons by state (sextiles) for all ages – United States, 2018, estimates created using previous IQVIA methodology.

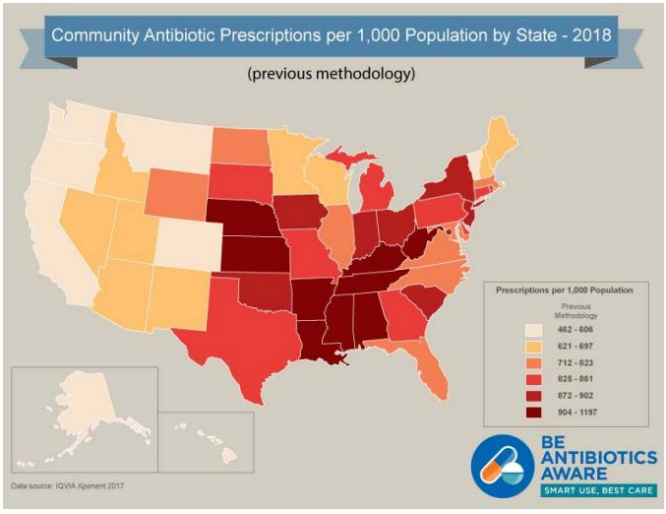

Figure 2. Antibiotic prescriptions per 1,000 persons by state (sextiles) for all ages – United States, 2018, estimates created using revised methodology accounting for reversed and voided prescriptions across weeks.

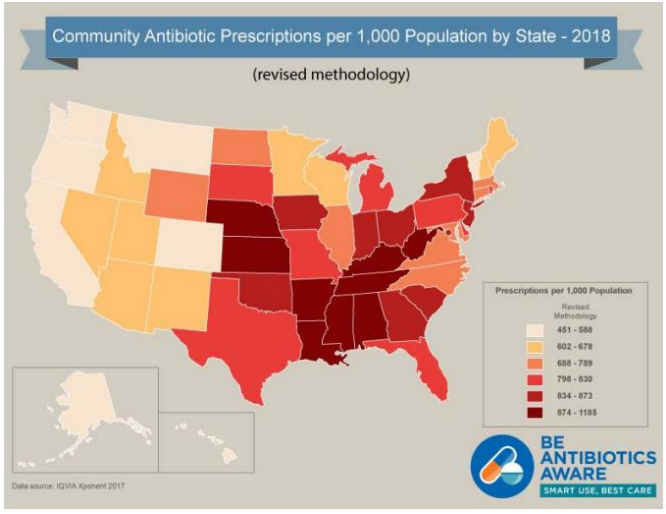

Table 4. Oral antibiotic prescribing by state – United States, 2018

State	Antibiotic Prescriptions Per 1,000 Persons, Rate[a]	
	Previous methodology[b]	Revised methodology[c]
Alabama	1158	1116
Alaska	462	451
Arizona	697	669
Arkansas	1051	1011
California	537	518
Colorado	531	515
Connecticut	825	789
Delaware	853	805
District of Columbia	872	830
Florida	823	798
Georgia	861	834
Hawaii	598	577
Idaho	648	634
Illinois	785	750
Indiana	875	844
Iowa	902	873
Kansas	904	874
Kentucky	1174	1127
Louisiana	1169	1122
Maine	673	650
Maryland	746	718
Massachusetts	725	696
Michigan	841	814
Minnesota	621	602
Mississippi	1170	1117
Missouri	835	806
Montana	593	584
Nebraska	973	935
Nevada	682	653
New Hampshire	694	678
New Jersey	874	844
New Mexico	672	637
New York	891	857
North Carolina	799	775
North Dakota	712	688
Ohio	901	869
Oklahoma	888	849
Oregon	495	490
Pennsylvania	841	811
Rhode Island	859	824
South Carolina	900	868
South Dakota	830	811
Tennessee	1084	1037
Texas	831	803
Utah	686	665
Vermont	606	588
Virginia	745	718
Washington	531	519
West Virginia	1197	1185
Wisconsin	656	632
Wyoming	778	753

a. Rates were calculated using population data obtained from the 2018 U.S. Census.

b. Estimates created using previous IQVIA methodology.

c. Estimates created using data from revised methodology accounting for reversed and voided prescriptions across weeks.

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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.