Antibiotic Resistance Patient Safety Portal

Outpatient Antibiotic Prescription Data

Data Methodology

Methods

For this dataset of the Patient Safety Portal, dispensing data for oral antibiotic prescriptions are extracted from the Xponent database from IQVIA (Danbury, Connecticut). IQVIA collects dispensing data from retail pharmacies which report their entire business to IQVIA each week. IQVIA reports capturing 92%* of outpatient prescriptions dispensed in U.S. retail pharmacies and reconciles them to wholesale deliveries.
Then using a patented projection methodology, IQVIA projects to 100% of retail prescriptions sold to the patient. The estimated prescription counts from non-sampled pharmacies are aligned with providers' prescribing behavior observed for the same products at nearby sampled pharmacies. IQVIA reports routinely validating this method. (See Hicks LA, Bartoces MG, Roberts RM, et al. US Outpatient Antibiotic Prescribing Variation According to Geography, Patient Population, and Provider Specialty in 2011. *Clin Infect Dis.* 2015;60(9):1308-1316.)

Antibiotics are then classified into antibiotic classes based on mechanisms of action using IQVIA's Uniform System of Classification. These classes include: tetracyclines, cephalosporins, lincosamides, macrolides, penicillins, fluoroquinolones, trimethoprim-sulfamethoxazole, beta-lactams with increased activity, urinary anti-infectives and others. (See Uniform System of Classification 2018).

Rates of antibiotic prescriptions per 1,000 population are calculated using population data obtained from the U.S. Census bridging files by age group and sex. Location is defined by the state of the prescribing provider. Prescriptions with missing age group or sex data are included in all ages and all sexes but are excluded from analyses by specific age or sex category. Analyses were performed using SAS (Cary, North Carolina).

Note: In 2017, IQVIA revised their methodology to account for prescriptions not picked up, returned, or re-stocked. These situations may have led to overstated prescriptions and makes the revised methodology data more accurate. Previous methodology data should not be directly compared to revised methodology. Data using both revised and previous methodology data are available in the 2017 and 2018 Annual Reports (https://www.cdc.gov/antibiotic-use/data/outpatient-prescribing/index.html), however only revised data is available for 2019 onward.

Limitations

IQVIA Xponent data has at least the following limitations:

- Data were not collected for public health purposes. The data in these customized extracts have predefined age categories, preventing analyses of other age categories.
- Data do not contain diagnoses or indications for prescriptions, and thus appropriateness of the prescription cannot be assessed.
- Because the data represent prescriptions, individuals cannot be followed over time. Multiple prescriptions may be dispensed to the same individual.

*Capture of Outpatient Prescriptions in IQVIA

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
74%	74%	78%	86%	86%	88%	90%	92%	92%	92%

These coverage percentages include all products and markets in the retail channel and can vary by market and geography.

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Data Dictionary

Variable	Description	Possible Values
Location	Prescriber location	State of prescriber or national for national data
Year	Year prescription dispensed	2019-2020
• Age Group	Age group in years of patient who received antibiotic prescription	• 0-19 years of age • 20 years of age and older • All ages Prescriptions with missing age data are excluded from age group categories 0-19 years and 20 years and older but are included in the all ages category.
Sex	Sex of patient who received antibiotic prescription	• Male • Female • All sexes Prescriptions with missing sex data are excluded from male and female categories but included in the all sexes category.
Antibiotic Class	Class of antibiotic prescribed; defines a related group of antibiotics	For national data, up to 10 classes allowed, plus all classes • All classes (all antibiotics, regardless of class) • Penicillins (e.g., penicillin, amoxicillin) • Macrolides (e.g., azithromycin, erythromycin) Cephalosporins (e.g., cephalexin, cefdinir) • Fluoroquinolones (e.g., ciprofloxacin, levofloxacin) • Beta-lactams with increased activity (e.g., amoxicillin/clavulanate) • Tetracyclines (e.g., tetracycline, doxycycline) • Trimethoprim-sulfamethoxazole • Urinary anti-infectives (e.g., nitrofurantoin) • Lincosamides (e.g., clindamycin) • Other (any antibiotics not included in above classes) Individual classes sum to all classes for national data. **For state data, only 4 classes allowed plus all classes** • All classes (all antibiotics, regardless of class) • Penicillins (e.g., penicillin, amoxicillin) • Macrolides (e.g., azithromycin, erythromycin) • Cephalosporins (e.g., cephalexin, cefdinir) • Fluoroquinolones (e.g., ciprofloxacin, levofloxacin) The sum of penicillins, macrolides, fluoroquinoloes, andcephalosporins does not total to all classes due to exclusion of additional antibiotic classes at the state level.
Rate	Rate of antibiotic prescriptions dispensed per 1,000 population	Continuous variable
Antibiotic Class Percent of All Antibiotics	Percent that a specific antibiotic class contributes to all antibiotic prescriptions	Percent