

Antimicrobial Prescription Data Reveal Wide Geographic Variability in Antimicrobial Use in the United States, 2009

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Background

- Reducing inappropriate antimicrobial use is one strategy to decrease the spread of antimicrobial resistance.
- However, the settings in which antibiotics are most-prescribed and the geographic distribution of antimicrobial use are not well-understood in the United States.
- We analyzed antibiotic sales and prescriptions to assess where antibiotics are most often prescribed and to evaluate geographic differences in antibiotic use in the outpatient setting.

Methods

- To evaluate antibiotic sales by setting, we evaluated the distribution of prescriptions by healthcare setting using IMS Health© National Sales Perspectives Data.
- This dataset measures the volume of drug products, both prescription and over-the-counter, moving from manufacturers into various outlets within the retail and non-retail markets.
- Retail pharmacy antibiotic prescriptions by state were extracted from the 2009 IMS Health© Xponent® database.
- These data represent a statistically valid projection of all prescriptions, across all payers, filled in retail pharmacies in the U.S.
- Prescriptions per capita, were calculated using IMS Health© data and 2008 U.S. Census Bureau population estimates (adjusted using CIA Fact Book data to approximate the 2009 population).
- Antibiotics were stratified into class as defined by American Hospital Formulary Service (AHFS) Drug Information® database.

Resources

- www.cdc.gov/getsmart
- AHFS Drug Information Database. <http://www.ahfsdruginformation.com/>
- <http://www.cdc.gov/drugresistance/index.htm>

Contact information

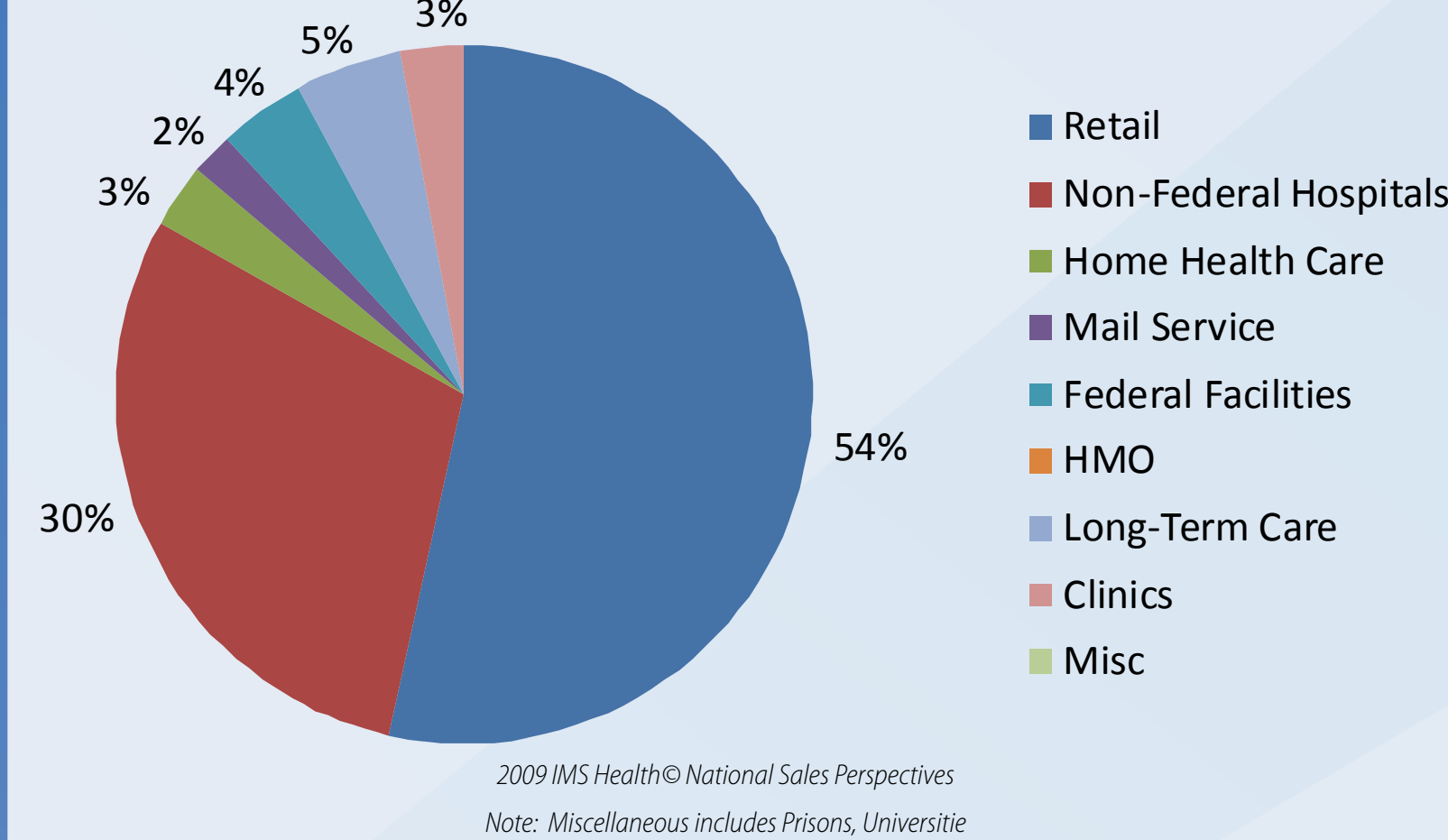
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Results

U.S. Antibiotic Sales by Setting, 2009

- In 2009, antibiotic sales in the U.S. in all settings totaled \$10.7 billion.
- In total, 67% of all antibiotics sales were in non-acute care settings for a total of approximately \$7.1 billion in antibiotic costs.
- Over 80% of fluoroquinolones and macrolides, antibiotic classes with broad-spectrum antimicrobial activity, were sold in non-acute care settings.
- The class of antibiotics that accounted for the most expenditures was fluoroquinolones (\$2.5 billion), \$2.0 billion in non-acute care settings.

Figure 1. U.S. Antibiotic Sales by Setting, 2009



U.S. Antibiotic Prescriptions, 2009

- The antibiotic prescription rate in the retail setting was 0.86 prescriptions per capita in 2009 for the entire U.S.
- The prescribing rate was highest for macrolides (0.22), followed by penicillins (0.20), cephalosporins (0.12) and fluoroquinolones (0.11).
- The South U.S. prescription rate was significantly higher than the rate for the West (t-test, $p < 0.001$).
- CDC-funded states with appropriate antibiotic use campaigns had a prescribing rate of 0.81 compared to 0.88 for unfunded states (t-test, $p < 0.001$).
- Prescription rate patterns by state for individual classes of antibiotics were similar to the rates for all antibiotics.

Figure 2. Overall Antibiotic Prescriptions per Capita by State, 2009



Figure 3. U.S. Antibiotic Prescription Rates per Capita, 2009 Highest and Lowest Use States

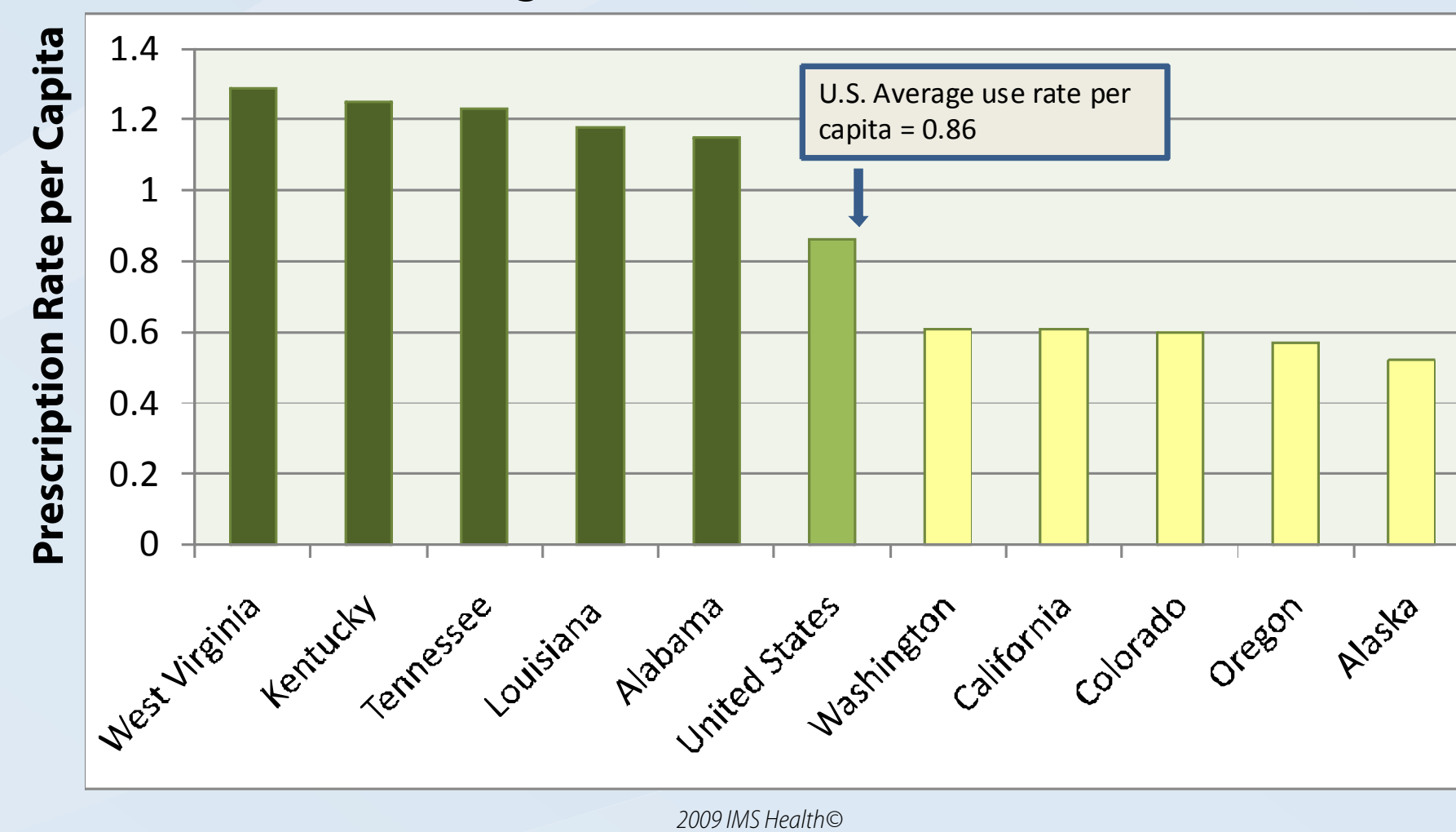


Figure 4. Macrolide Prescriptions Per Capita by State, 2009¹



Figure 5. Fluoroquinolone Prescriptions per Capita by State, 2009



Conclusion

- The majority of antibiotic sales in 2009 took place in the retail setting.
- Macrolides were the most commonly prescribed class of antibiotics in the retail setting.
- There was marked geographic variability in antibiotic use with much higher prescription rates in the South as compared to the West.
- States with active appropriate use campaigns (e.g. Get Smart: Know When Antibiotics Work) have lower prescribing rates.

Next steps

- Future studies should evaluate the factors that are contributing to the geographic differences in antibiotic prescribing in the U.S.
- Improving our understanding of the demographic and cultural influences on prescribing could lead to targeted interventions to reduce inappropriate antibiotic use.

