

Background

- Antibiotic stewardship: coordinated set of interventions designed to improve and measure antibiotic use, to improve patient outcomes and minimize harm¹
- 80% of total antibiotic use occurs in outpatient settings²⁻⁴
 - Approximately 40% occurs in urgent care centers (UCCs) and retail clinics⁴
- At least 30% of outpatient antibiotics are inappropriate²⁻⁵
 - Inappropriate antibiotic prescribing highest in UCCs (45.7%)⁴
- Multiple consequences of inappropriate antibiotic prescribing, including increased risks of:^{1,3}
 - Clostridium difficile* infection
 - Antimicrobial resistance
 - Adverse effects and drug interactions
 - Costs
- Despite large numbers of antibiotics prescribed in UCCs, few centers have described implementing antibiotic stewardship in such settings

Study Aims

- To describe implementation of antibiotic stewardship in our UCCs
- To reduce total antibiotic utilization within our UCCs
- To reduce total azithromycin utilization within our UCCs

Methods

Study design: Prospective performance improvement project

Setting:

- Five UCCs, averaging >70,000 visits annually, owned by a 2-hospital, >1,100-bed community-based academic healthcare system in northern Delaware
- UCCs employ 38 providers (physicians, physician assistants and nurse practitioners)

Data collection:

- Calculated number of total antibiotic prescriptions and of azithromycin prescriptions per 100 visits per month
- Calculated rate ratios comparing pre-intervention to post-intervention periods

References:

- Barlam TF, Cosgrove SE, Abbo LM, et al. Clin Infect Dis. 2016;62:e51-77.
- Fleming-Dutra KE, Hersh AL, Shapiro DJ, et al. JAMA. 2016;315:1864-73.
- The White House. National action plan for combating antibiotic-resistant bacteria. <https://www.whitehouse.gov>.
- Palms DL, Hicks LA, Bartoces M. JAMA Intern Med. 2018;178:1267-1269.
- Meeker D, Knight TK, Friedberg MW. JAMA Intern Med. 2014;174:425-31.

Methods

Figure 1. Timeline and Interventions.

UCCs Commit to Implementing Antibiotic Stewardship	January 2017 – Present: UCCs joined regional Medicare Quality Improvement Organization's outpatient antibiotic stewardship program
U.S. Centers for Disease Control & Prevention (CDC) Resources Available	February 2017 – Present: CDC antimicrobial stewardship poster & commitment letter displayed in exam rooms & pamphlets made available
Education Materials Embedded in Electronic Medical Record (EMR)	March 2017 – Present: Patient education on appropriate antibiotic use is critical → education materials were made to be readily available in EMR
Antimicrobial Stewardship Presentation for UCC Providers	April 2017: Antimicrobial stewardship team delivered lecture to UCC providers, focusing on management of common infections
Standardization of Diagnostic Criteria and Therapeutic Management	April 2017 – Present: National guidelines used to standardize infection management, focusing on avoiding antibiotics for viral infections
Chart Audit and Feedback on Antibiotic Prescribing within UCCs	April 2017 – May 2018: UCC lead physician performed chart audits & feedback on antibiotic prescribing was provided in-person & via email
Antibiotic Utilization Data	February 2018 – Present: Information technology (Health Catalyst) generated antibiotic utilization data
Antibiotic Utilization Data Released to UCC Providers	May 2018 – Present: UCC providers began receiving monthly emails with antibiotic utilization data, allowing for peer-to-peer comparisons

Results

Figure 2. Antibiotic Utilization Data at Urgent Care Centers

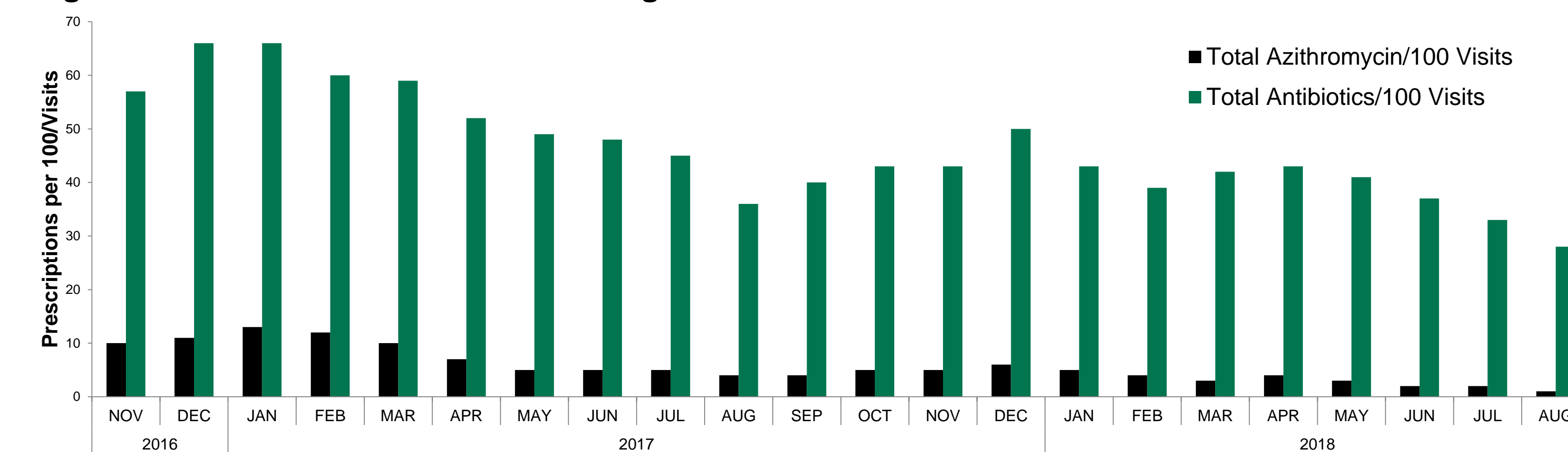


Table 1. Antibiotic Doses per 100 Patient Visits

	Pre-Antibiotic Stewardship (Nov/Dec 2016)	Post-Antibiotic Stewardship (July/Aug 2018)	Percent Change	Rate Ratio (95% Confidence Interval)
Total Antibiotics	61.8	30.7	50.3% ↓	0.49 (0.48 – 0.52)
Azithromycin	11.9	1.4	88.5% ↓	0.12 (0.10 – 0.13)

Results

Figure 3. Respiratory Tract Infections Treated with Azithromycin

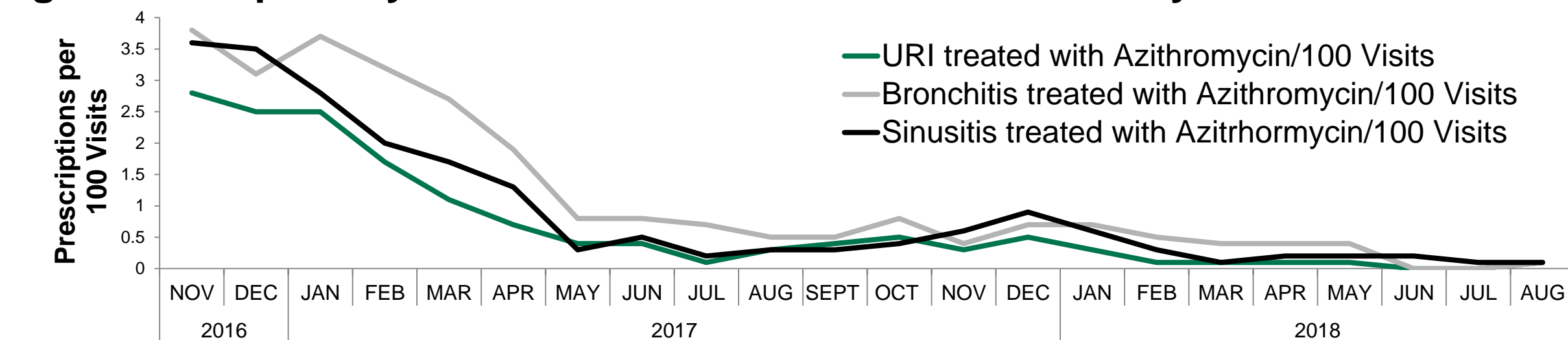


Figure 4. Antibiotics Used for Sinusitis

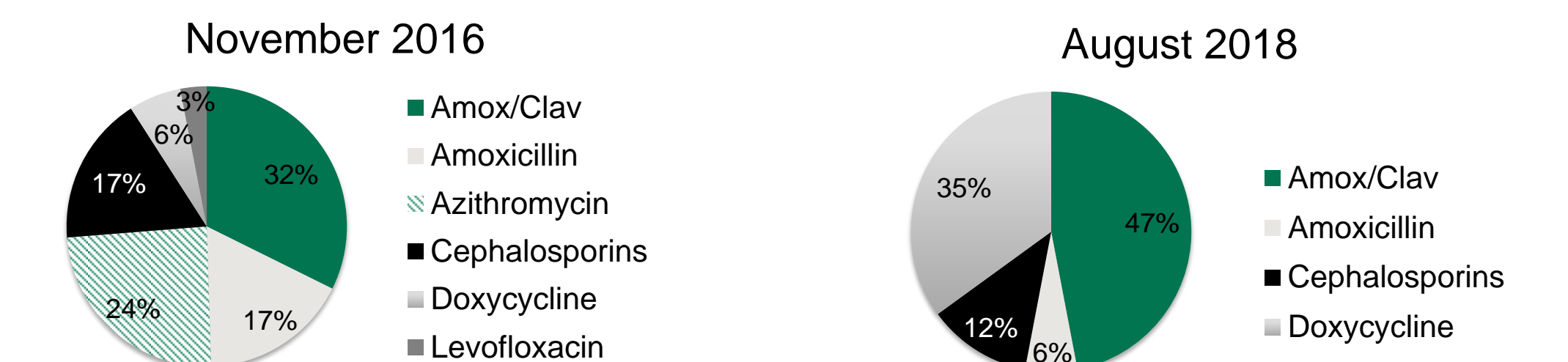


Table 2. Antibiotic Doses per 100 Patient Visits by Age

	Pre-Antibiotic Stewardship (December 2016)	Post-Antibiotic Stewardship (August 2018)	Percent Change
0-17 Years Old	63	20	68.2% ↓
≥18 Years Old	64	31	51.6% ↓

Discussion and Conclusion

- Antibiotic stewardship strategies that worked well:
 - Multifaceted educational approach, including in-person lectures, distribution of national guidelines and readily available CDC resources
 - Consistent UCC leadership support for providers and staff
 - Engagement of front-line UCC providers to standardize infection management
 - Performance of chart audits and direct feedback regarding antibiotic prescribing
- Limitations and barriers:
 - Data is unavailable prior to November 2016 due to change in EMR
 - Performance of manual chart audits and providing feedback is labor intensive
 - Limited time for provider and patient conversations on appropriate antibiotic use
 - Patient perceptions and expectations of appropriate antibiotic use
- Conclusions:
 - Total antibiotic utilization decreased by 50.3% over the 20-month intervention period and azithromycin utilization decreased by 88.5%
 - Decrease in antibiotic utilization was consistent for pediatric and adult patients
 - Azithromycin utilization for respiratory tract infections consistently decreased
 - For sinusitis, appropriateness of antibiotic selection increased and use of azithromycin and levofloxacin diminished