Outpatient prescribing during the COVID-19 pandemic

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Background

- 80-90% of antibiotic use occurs in the outpatient setting and at least 30% of antibiotics prescribed are unnecessary
- The Joint Commission requires ambulatory healthcare systems to collect, analyze, and report data on antimicrobial prescribing
- Duke University Health System (DUHS) piloted a dashboard to capture outpatient prescribing for children with viral upper respiratory infection (URI)
- Dashboard implementation in 2020 allowed assessment of the impact of the pandemic on antibiotic prescribing

Methods

- Children (0 to <19 years) seen 1/1/2019 - 2/21/2021 for URI and pharyngitis
- Patient characteristics included: age, sex, race, ethnicity, Pediatric Medical Complexity Algorithm (PMCA) score, insurance status (public v. private)
- Provider characteristics included: type (physician, NP, PA) and specialty (pediatrics, family medicine, internal medicine, other)
- Compared pre- and post-COVID (defined as March 1, 2020) prescribing and prescribing during telehealth v. in-person visits
- Logistic regression model used to identify factors independently associated with prescribing

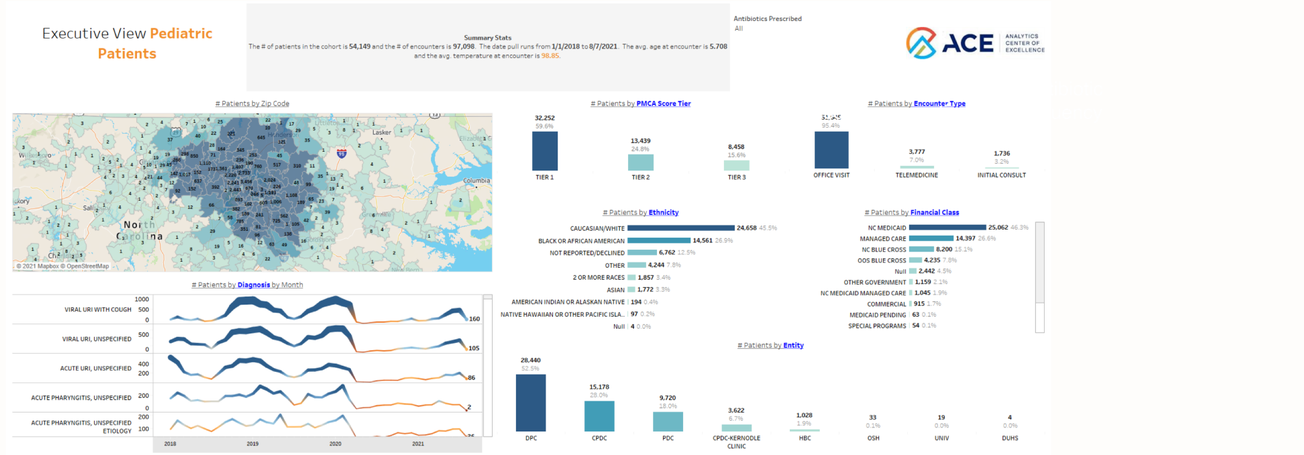
Results

- 62,447 children were seen during study period, 29% received an antibiotic
- Amoxicillin was the most commonly prescribed antibiotic (64.4%), followed by cefdinir (11%), amoxicillin-clavulanic acid (10%), and azithromycin (8%)
- White race, private insurance, visits with nurse practitioners and with non-pediatric providers were associated with higher likelihood of antibiotic prescribing (Table 1)
- Higher PMCA scores, indicating greater medical complexity, were associated with decreased likelihood of prescribing antibiotics (Table 1)
- Although the total number of outpatient visits substantially decreased during the COVID period, rates of prescribing only decreased mildly from 31% to 25%(Figure 1)

Key Conclusions

- Outpatient prescribing for URI at DUHS was associated with multiple patient and provider characteristics
- Similar to other studies, white race, private insurance, and visits with non-physician, non-pediatric providers were associated with antibiotic prescription
- Despite a large decrease in the number of outpatient visits during the pandemic, rates of prescribing for URI decreased minimally
- Identification of factors associated with inappropriate prescribing during the pandemic can be used to develop targeted outpatient stewardship interventions as COVID mitigation strategies are lifted
- Next steps include providing targeted education to specific providers on their individual antibiotic prescribing patterns in an effort to decrease inappropriate prescriptions

Dashboard visualization of diagnosis by patient location and demographic data



Dashboard visualization of antibiotic prescriptions by type over time

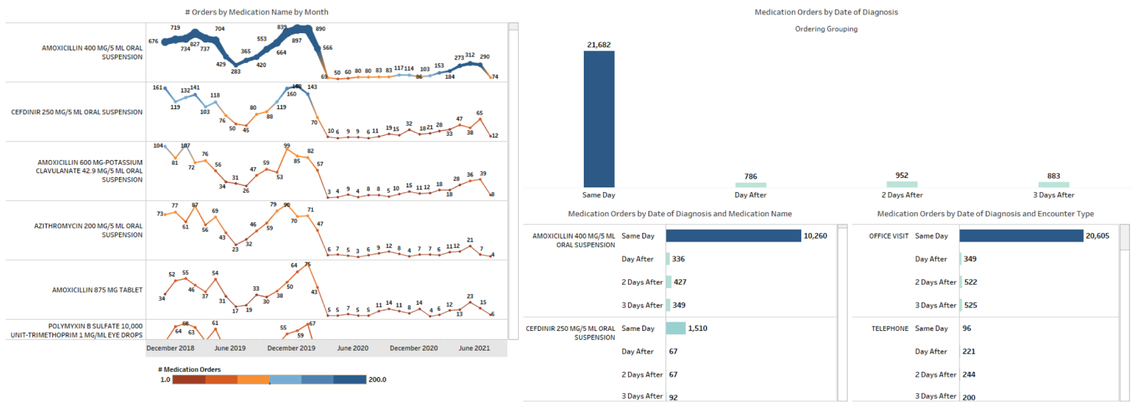
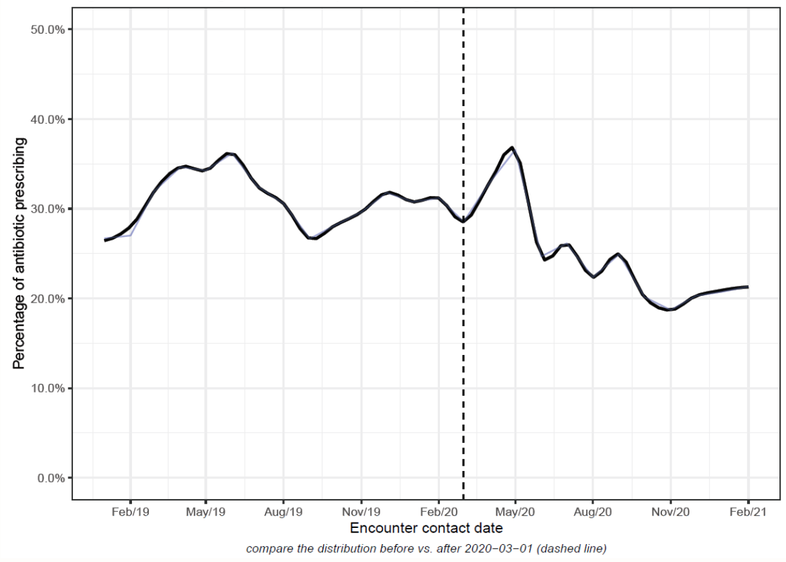


Figure 1: Percentage of antibiotic prescribing from 2019−01−01 to 2021−02−21



compare the distribution before vs. after 2020−03−01 (dashed line)

Table 1: Factors associated with antibiotic prescribing

Factor	Odds Ratio (95% Confidence Interval)
Age (years)	1.05 (1.04 – 1.05)
Sex	
Male	Ref
Female	0.97 (0.94 – 1.01)
Race/Ethnicity	
Hispanic	Ref
Non-Hispanic Black	0.92 (0.87 – 0.98)
Non-Hispanic White	1.15 (1.09 – 1.22)
Other/Unknown	0.97 (0.91 – 1.04)
Insurance Status	
Public	Ref
Private	1.23 (1.19 – 1.28)
Other/Unknown	1.20 (1.08 – 1.33)
PMCA Score	
Tier I	Ref
Tier 2	0.92 (0.88 – 0.96)
Tier 3	0.93 (0.88 – 0.98)
Telemedicine	
No	Ref
Yes	0.41 (0.36 – 0.46)
Provider Type	
Physician (MD/DO)	Ref
Nurse Practitioner	1.22 (1.17 – 1.28)
Physician Assistant	1.05 (0.99 – 1.12)
Resident	0.49 (0.48 – 0.55)
Provider Specialty	
Pediatrics	Ref
Family Medicine	1.45 (1.34 – 1.52)
Internal Medicine	1.45 (1.30 – 1.61)
COVID Indicator	
Before March 1, 2020	Ref
On or after March 1, 2020	0.90 (0.85 – 0.94)