# An Exploratory Analysis to Examine Urgent Care Antibiotic Prescribing Inequities in a Vertically Integrated Healthcare System

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## BACKGROUND

- Healthcare disparities and inequities exist in a variety of environments and manifest in diagnostic and therapeutic measures (Table 1)[1-3].
- Previous studies have shown antibiotic prescribing differences based on patient demographics which may represent inequitable care[4-8].
- Nearly 40% of urgent care (UC) encounters may be associated with outpatient antibiotic prescriptions. Urgent care centers are also associated with the highest rate of inappropriate prescribing for respiratory tract infections (RTIs) in the United States[9,10].
- UC clinics have been a focus for antibiotic stewardship interventions across Intermountain Healthcare (IH).
- As part of an organizational commitment to health equity, we conducted an exploratory, electronic health record (EHR)-based analysis of antibiotic prescribing for respiratory encounters in our UC centers to identify potential inequities in antibiotic prescribing.

## METHODS

- IH is a nonprofit integrated healthcare delivery system in the Mountain West and operates 38 UC clinics. We limited our exploratory analysis to encounters from July 1st 2018 – June 30th 2019 and included patients of all ages.
- Selected patient characteristics for assessment were based on data availability in our EHR. We included age group (<18 years-old, 18-65 years-old, and 65+ years-old), body mass index (BMI) ≥25 and <25 (overweight/obese and non-obese), race, ethnicity, preferred language, clinician-patient gender combination, and clinician type (physician or advanced practice clinician (APC)). Patient race, ethnicity, preferred language, and gender are self-reported.
- Individual respiratory encounters were identified using a validated methodology based on ICD10 codes[11]. Antibiotic prescribing rates for respiratory conditions overall and rates for Tier 3 respiratory conditions (conditions in which antibiotics are not indicated, e.g., acute uncomplicated bronchitis) were assessed.
- Because no standard definition exists to identify a disparity or inequity, we considered an absolute percentage difference between groups within a characteristic group of ≥5.0% to represent a potential disparity or inequity where further evaluation was merited.

TABLE 1. Contemporary definitions and descriptions for health equity, disparity, inequity, and determinants of health[1-3].

| | |
|---|---|
| **Health Equity** | ▪ **Everyone has a fair and just opportunity to attain the highest level of health possible.** |
| Health Disparity | ▪ Preventable differences in disease burden, injury, violence, services, outcomes, or any opportunity to achieve optimal health care by some variable (e.g. age, race, insurance) which may or may not be clinically justifiable.<br>▪ Often experienced by populations that have been disadvantaged by social or economic status, geographic location, sexuality, language, or environment.<br>▪ Racial and ethnic minorities, women, people in the Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and others who do not identify as cisgender or heterosexual (LGBTQI+) community, those with limited English proficiency, and other populations experience health disparities. |
| Health Inequity | ▪ Extends from the definition of Health Disparity<br>▪ Any unjust disparity due to implicit or explicit biases at the individual or societal level, historical structures, social mechanisms, or other pressures. |
| Determinants | ▪ Social: Education, Insurance<br>▪ Economic: Personal and generational wealth or poverty<br>▪ Geographic/Environmental: Urban, rural, greenspace, zip code, Area deprivation index<br>▪ Personal: Sexual orientation, Gender identity<br>▪ Behavioral: Diet, Exercise<br>▪ Biologic: Comorbidities, Age<br>▪ Health Systems: Provider and System Bias |

## RESULTS

- 93,588 (48.5%) of 193,107 respiratory urgent care encounters were associated with an antibiotic prescription.
- Overall antibiotic prescribing rates (Table 2) were higher in white compared to non-white patients (49.0% vs 38.2%) and in those reporting non-Hispanic ethnicity compared to Hispanics (49.1% vs 43.2%).
- Patients over 18 years-old were prescribed antibiotics more frequently than younger patients.
- Among Tier 3 encounters male providers prescribed antibiotics more frequently for male patients than female providers did for female patients (20.8% vs 15.6).
- Overweight and obese patients with Tier 3 diagnoses received antibiotic prescriptions more frequently than non-obese patients (22.8% vs 15.3%).
- Minimal differences between patients who preferred English and those who preferred non-English languages were observed.

## CONCLUSIONS

- Antibiotic prescribing rates for respiratory conditions in urgent care encounters in our system differed based on race, ethnicity, age, obesity, and gender. These differences may represent biases contributing to inequities in care and may serve as a focus for improved stewardship efforts.
- Our evaluation has multiple limitations. This was an exploratory, EHR-based investigation and our purpose was to identify areas in which potential inequities might exist. We report observed differences in a univariate analysis and did not assess for confounding. Our study also encompassed the period prior to the COVID-19 pandemic. Further study and multivariable modeling could help better understand which features are most strongly associated with inequitable prescribing and aid in identifying actionable areas for interventions.
- Small numbers of non-White, Hispanic, and non-English speaking patients may limit the generalizability of these findings. Including patients of all ages in our demographic analysis may impact observed differences in a variety of categories (BMI, gender, race, ethnicity, language). Further analysis of specific age groups is needed.
- Limited sexual orientation and non-binary gender identity (SOGI) data within our EHR precluded our ability to evaluate differences in care received by LGBTQI+ patients. Efforts are underway to improve capturing SOGI information along with other patient characteristics to optimize future inequity analyses across our system.

TABLE 2. Overall antibiotic prescribing rates and antibiotic prescribing rates for Tier 3 conditions for urgent care respiratory condition encounters July 1st, 2018 – June 30th, 2019*¥.

| Characteristic | Overall Received Abx | Tier 3 Received Abx |
|---|---|---|
| **Age Group, N (%)** | | |
| **<18 years-old** | 24,529 (45.8%) | **2,332 (10.7%)** |
| **18-65 years-old** | 60,737 (49.4%) | **10,350 (20.8%)** |
| **>65 years-old** | 8,322 (50.1%) | **2,924 (30.2%)** |
| **BMI, N (%)** | | |
| **Non-obese (BMI <25)** | 35,035 (46.6%) | **4,595 (15.3%)** |
| **Overweight & Obese (BMI ≥25)** | 50,632 (50.0%) | **9,999 (22.8%)** |
| **White Race, N (%)** | | |
| **No** | **1,278 (38.2%)** | **216 (13.1%)** |
| **Yes** | **87,443 (49.0%)** | **14,559 (19.7%)** |
| **Ethnicity, N (%)** | | |
| **Hispanic** | **8,443 (43.2%)** | 1,335 (15.0%) |
| **Non-Hispanic** | **83,298 (49.1%)** | 13,985 (19.9%) |
| **Patient Language, N (%)** | | |
| **English** | 92,035 (48.6%) | 15,319 (19.3%) |
| **Non-English** | 1,465 (44.2%) | 285 (17.3%) |
| **Patient Female, N (%)** | | |
| **No** | 39,832 (48.4%) | 7,100 (19.7%) |
| **Yes** | 53,752 (48.5%) | 8,505 (18.9%) |
| **Provider Female, N (%)** | | |
| **No** | 72,902 (49.1%) | 12,612 (20.3%) |
| **Yes** | 20,686 (46.5%) | 2,994 (15.9%) |
| **Provider Type, N (%)** | | |
| **MD/DO** | 79,306 (48.2%) | 13,697 (19.9%) |
| **Advanced practice clinician** | 14,282 (49.8%) | 1,909 (15.9%) |
| **Patient/Provider Gender Combination** | | |
| **Female Provider, Female Patient** | 11,997 (46.5%) | **1,654 (15.6%)** |
| **Female Provider, Male Patient** | 8,688 (46.5%) | 1,340 (16.3%) |
| **Male Provider, Male Patient** | 31,144 (48.9%) | **5,760 (20.8%)** |
| **Male Provider, Female Patient** | 41,755 (49.1%) | 6,851 (19.9%) |

*Tier 3 codes are those where antibiotics are not indicated (eg acute uncomplicated bronchitis). ¥Absolute differences of ≥5.0% between groups within each category are indicated in bold.

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