

Clinical Characteristics and Demographics of Patients with Complicated Urinary Tract Infections (cUTI) and Antibiotic Resistance or Treatment Failure: A Retrospective Database Analysis

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ABSTRACT

Background: The incidence of complicated urinary tract infection (cUTI) in the United States estimated to be approximately 1%; however, the majority of published literature focuses on characterizing hospitalized cUTI patients. Limited data exists detailing the clinical characteristics and demographics of cUTI patients more generally; in particular, those experiencing antibiotic resistance and/or treatment failure, many of whom currently lack effective oral treatment options in the outpatient setting, yet may not have severe enough disease to warrant hospitalization. Here, we examine the clinical and demographic characteristics of this patient group.

Methods: A retrospective study was performed in partnership with Komodo Health, Inc., using aggregate data from the Komodo Healthcare Map™ for cUTI-related events. Inclusion criteria: (1) 2+ UTI-related encounters within 35 days, beginning in 2017-2018, (2) clinical/coding features indicative of recurrence, treatment failure or antibiotic resistance, or treatment with carbapenem or piperacillin/tazobactam. Clinical and demographic characteristics were examined.

Results: 3,334,497 cUTI patients were identified; 1,889,216 patients with evidence of treatment failure and/or antibiotic resistance were eligible for analysis. 76.7% were female, and 40.2% were >65 years of age. 61.8% of patients had hypertension, 42.5% had hyperlipidemia, and 32.3% had uncomplicated type 2 diabetes. 38.7% had concomitant gastroesophageal reflux disease; 17.0% had mild renal impairment and 29.5% had moderate/severe renal impairment. Most common treatments were nitrofurantoin (21.8%), trimethoprim sulfamethoxazole (19.2%), and cephalexin (14.4%). Approximately half (48.9%) of patients had an inpatient hospital stay during the study period.

Conclusion: cUTI patients with antibiotic resistance and/or treatment failure are predominantly female and present with a variety of common comorbidities, the most common being hypertension. Approximately half of patients in this cohort were treated successfully in outpatient settings and did not require hospitalization during the study period.

*Minor modifications were made to the analytics cohort between abstract submission and poster development, therefore slight variations in the data exist between the original abstract and displayed poster results.

INTRODUCTION

- Complicated urinary tract infections (cUTIs) are common bacterial infections encountered within both the community and hospital settings, accounting for ~3 million annual cases in the United States (US) alone.¹
 - It is estimated that 1 in 100 US adults will experience a cUTI each year.¹
 - Over 80% patients with cUTIs will initially seek care in the outpatient setting.¹
- Most cUTIs occur in women and the incidences for both women and men increases with age.²
- The presence of multiple common risk factors in patients with cUTIs is associated with increased disease severity and more frequent recurrences.^{3,4}
- UTIs are becoming more difficult to treat due to the global spread of antibiotic-resistant bacteria, particularly for the Enterobacteriaceae family, including *E. coli* and *K. pneumoniae*, which both have the ability to produce extended-spectrum β-lactamases (ESBLs).⁴

METHODS

The Komodo Healthcare Map™ represents approximately 320 million patient journeys in the United States. It is comprised of 150+ complete payer datasets and over 3.5 million providers. Here, the Komodo Healthcare Map™ was used to identify patients with an ICD-10 code-defined cUTI event in 2017-2018. A cUTI event was defined as a patient with ≥2 cUTI-related encounters within 1-35 days. Patients were further defined as having a "resistant" organism if one or more Z-codes indicating resistance were identified on any claim for the patient within the analysis window, and/or as experiencing "treatment-failure" if either of the following conditions were met:

- ≥2 unique treatment claims 3-35 days apart (may be oral, IV, or a combination)
- Any ≥2 IV treatment claims within 35 days

Demographic and clinical characteristics including comorbidities and common treatments were examined.

RESULTS

- 3,334,497 cUTI patients were identified over study period; 1,889,216 (57%) patients with evidence of treatment failure and/or antibiotic resistance were eligible for analysis.
- Patients with resistance and/or failure were typically older and Female, especially at younger ages.
- ~40% of patients with resistance and/or failure were age ≥65
- Nearly 50% of cUTI patients had CCI scores greater than 5.
- Patients had a mean of 4 cUTI-related visits per year.
- 35% of cUTI patients saw a urologist during the study period
- ~50% of cUTI patients were hospitalized each year (62% over the 2-year study period)
- The mean length of stay for inpatient cUTI hospitalizations was 7 days.
- 40% of the patient cohort had commercial insurance; 24% Medicaid; 24% Medicare, and 11% Medicare Advantage.

Figure 1: Age and Gender Distribution (n= 1,889,216)

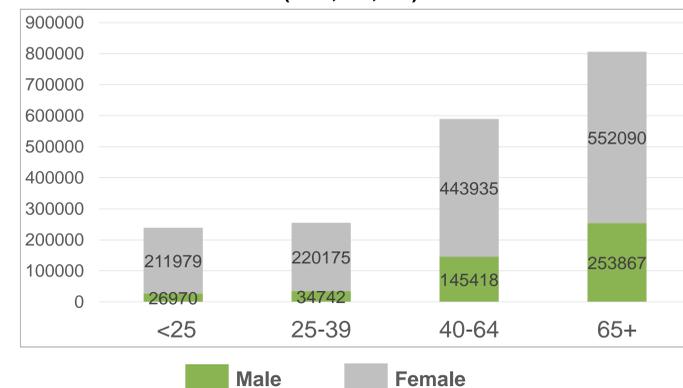


Figure 2: Charlson Comorbidity Index (CCI) (n=1,889,216)

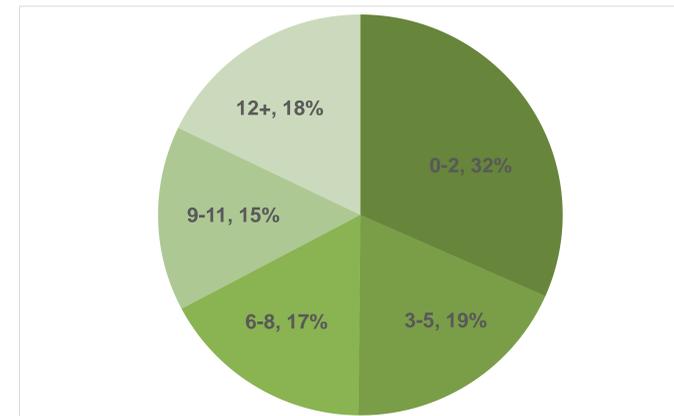
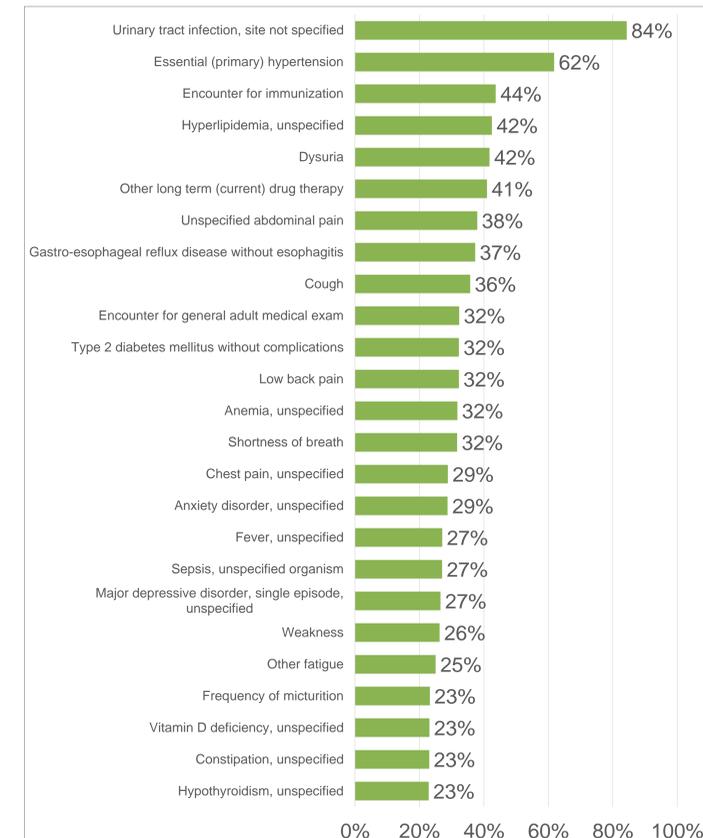


Table 1: Most Common Antibiotics (n=1,889,216)

Antibiotic Category	# Patients	%
Fluoroquinolones (2G)	1,101,914	58%
Aminopenicillins	880,149	47%
Cephalosporin (1G)	836,253	44%
SMX - TMP	812,338	43%
Cephalosporin (3G)	804,836	43%
Nitrofurantoin	788,244	42%
Azithromycin	597,271	32%

Table 2: Most Common Comorbidities (n=1,889,216)



CONCLUSIONS

- cUTI patients with antibiotic resistance and/or treatment failure are predominantly female and present with a variety of common comorbidities, the most common being hypertension.
- cUTI patients have substantial comorbidity burden, with nearly half of patients presenting with CCI scores greater than 5.
- Approximately half of patients in this 2-year study cohort were treated successfully in outpatient settings and did not require hospitalization during the study period.

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