

# Descriptive epidemiology and outcomes of emergency department visits with cUTI in the US, 2016-2018

Marya Zilberberg, MD, MPH<sup>1</sup> Brian Nathanson, PhD<sup>2</sup> Kate Sulham, MPH,<sup>3</sup> Andrew Shorr, MD, MPH, MBA<sup>4</sup>

<sup>1</sup>EviMed Research Group, LLC, Goshen, MA; <sup>2</sup>OptiStatim, LLC, Longmeadow, MA; <sup>3</sup>Spero Therapeutics, Cambridge, MA; <sup>4</sup>Washington Hospital Center, Washington, DC

## Introduction

- In the early 2000s annual ED visits for UTI numbered >1 million<sup>1</sup>
- Complicated UTI (cUTI), a fraction of total UTI, is estimated to have annual aggregate cost >\$6 billion<sup>2</sup>
- With rise in antimicrobial resistance, numbers of cUTIs are also rising
- Contemporary data on cUTI ED utilization are scant

## Study Aim

To evaluate the contemporary burden of annual ED visits with cUTI in the US

## Methods

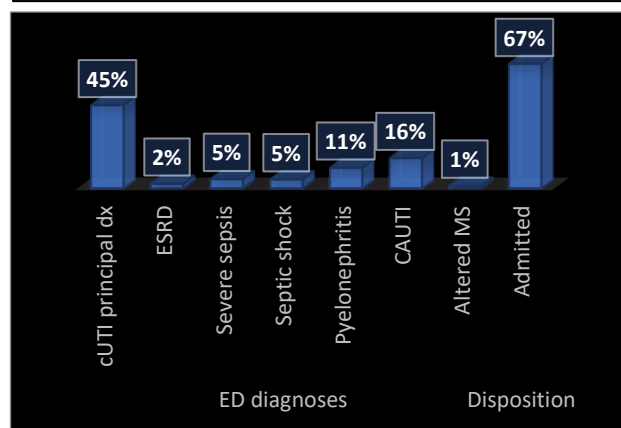
- Study design: retrospective cohort
- Data source: AHRQ's National Emergency Department Sample (NEDS)
  - 20% stratified sample of all US hospital-based EDs
- Time frame: 2016-2018
- Identified cUTI using a previously published algorithm based on administrative coding<sup>3</sup>
- Derived national estimates using survey methods

## Results

Table 1. Baseline characteristics

	N	%
Total cUTI visits	2,379,448	100%
Female gender	965,436	40.57%
Age 65+ years	1,480,305	62.2%
Medicare payor	1,549,495	65.1%
Metropolitan teaching hospital	637,548	26.79%
Southern US	1,455,402	61.17%

Figure 1. ED diagnoses and hospital admission

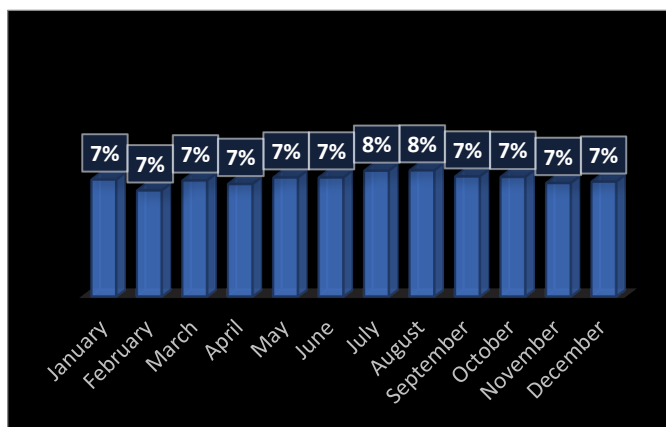


cUTI = complicated urinary tract infection; dx = diagnosis; ESRD = end-stage renal disease; CAUTI = catheter-associated UTI; MS = mental status

Table 2. Aggregate ED charges

	Total
Patients admitted from ED	
2016	\$ 1,094,832,911
2017	\$ 1,129,635,561
2018	\$ 1,167,711,824
Patients discharged from ED	
2016	\$ 1,721,471,343
2017	\$ 1,958,891,961
2018	\$ 2,070,883,531

Figure 2. Seasonal variation in ED visits with cUTI



## Main Findings

- Majority of cUTI ED visits are
  - Males
  - People 65+ years
  - Admitted to the hospital
- Nearly ½ of all cUTI visits are **for** cUTI
- Minority have CAUTI or pyelonephritis
- Under 10% have severe sepsis or septic shock
- In aggregate, visits that ended in discharge cost over \$2 billion in 2018

## Strengths & Limitations

- Misclassification due to administrative algorithm
- Since visit is the unit of analysis, cannot differentiate between first and repeat presentations
- NEDS lacks cost data, and charges frequently overestimate costs
- Data highly generalizable

## Conclusions

- There are ~800,000 ED visits with cUTI in the US annually
- Fewer than 10% have severe sepsis/septic shock, but 2/3rds get hospitalized
- Visits that end in discharge incur ~\$2 billion in annual charges

<sup>1</sup>Foxman B. Am J Med 2002;113:5S-13S

<sup>2</sup>Carreno JJ et al. Open Forum Infect Dis 2020;7:ofz536

<sup>3</sup>Zilberberg MD et al. Antimicrob Agents Chemother 2020;64:e00346-20