

University of Texas Rio Grande Valley

ScholarWorks @ UTRGV

MEDI 9331 Scholarly Activities Clinical Years

School of Medicine

Spring 2-1-2022

Catheter-associated urinary tract infections: patient characteristics, treatment, and clinical outcomes in one South Texas acute care hospital

Kimberly A. Ambrosini

The University of Texas Rio Grande Valley, kimberly.ambrosini01@utrgv.edu

Jose Campo Maldonado

The University of Texas Rio Grande Valley, jose.campomaldonado@utrgv.edu

Follow this and additional works at: <https://scholarworks.utrgv.edu/som9331>



Part of the [Bacteria Commons](#), [Bacterial Infections and Mycoses Commons](#), [Internal Medicine Commons](#), [Medical Microbiology Commons](#), [Quality Improvement Commons](#), and the [Urology Commons](#)

Recommended Citation

Ambrosini, Kimberly A. and Campo Maldonado, Jose, "Catheter-associated urinary tract infections: patient characteristics, treatment, and clinical outcomes in one South Texas acute care hospital" (2022). *MEDI 9331 Scholarly Activities Clinical Years*. 54.

<https://scholarworks.utrgv.edu/som9331/54>

This Article is brought to you for free and open access by the School of Medicine at ScholarWorks @ UTRGV. It has been accepted for inclusion in MEDI 9331 Scholarly Activities Clinical Years by an authorized administrator of ScholarWorks @ UTRGV. For more information, please contact justin.white@utrgv.edu, william.flores01@utrgv.edu.

Catheter-associated urinary tract infections: patient characteristics, treatment, and clinical outcomes in one South Texas acute care hospital

Kimberly Ambrosini, MS3; Jose Campo Maldonado, MD, MSCI, FACP
 University of Texas Rio Grande Valley School of Medicine

BACKGROUND

Catheter-associated urinary tract infections (CA-UTIs) account for 40 percent of nosocomial infections worldwide. The elimination of CA-UTIs is at the forefront of quality improvement in one South Texas acute care hospital.

Duration of catheterization is the most important determinant of infection and bacteriuria with risk increasing by 3% to 7% each day after placement of an indwelling urinary catheter.

The most common cause of CA-UTIs is uropathogenic *E. coli*, followed by *Klebsiella pneumoniae* and *Staphylococcus saprophyticus*. Additional common strains include *Enterococcus* species, group B streptococcus, *Proteus* species, and *Pseudomonas aeruginosa*.

Treatment recommendations include empiric antibiotic therapy may initially be broad spectrum but should then be optimized according to culture and susceptibility results. Inappropriate management has been linked with development of antibiotic resistance, bacteremia, and increased morbidity and mortality.

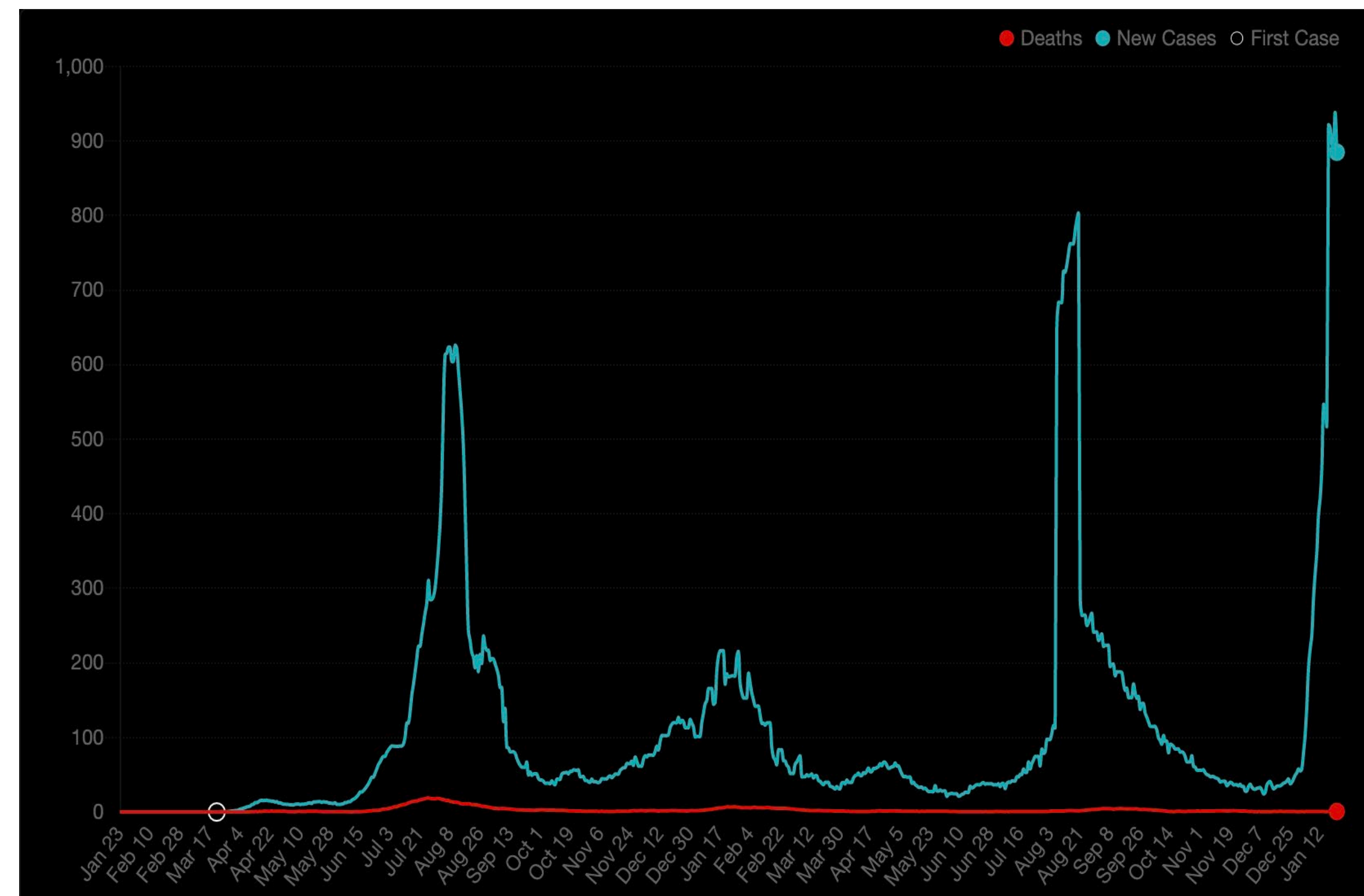
METHODS

Over a period of 6 months, five CA-UTIs occurred in one South Texas acute care hospital. These cases were identified via regular surveillance by the Laboratory Department and Infection Prevention staff, who then conduct a thorough analysis of each hospital-acquired infection. This research reviews patient age, sex, length of stay, bacteria contracted, appropriate antibiotic use, patient characteristics, overall outcomes and overlying COVID-19 trends in the local community.

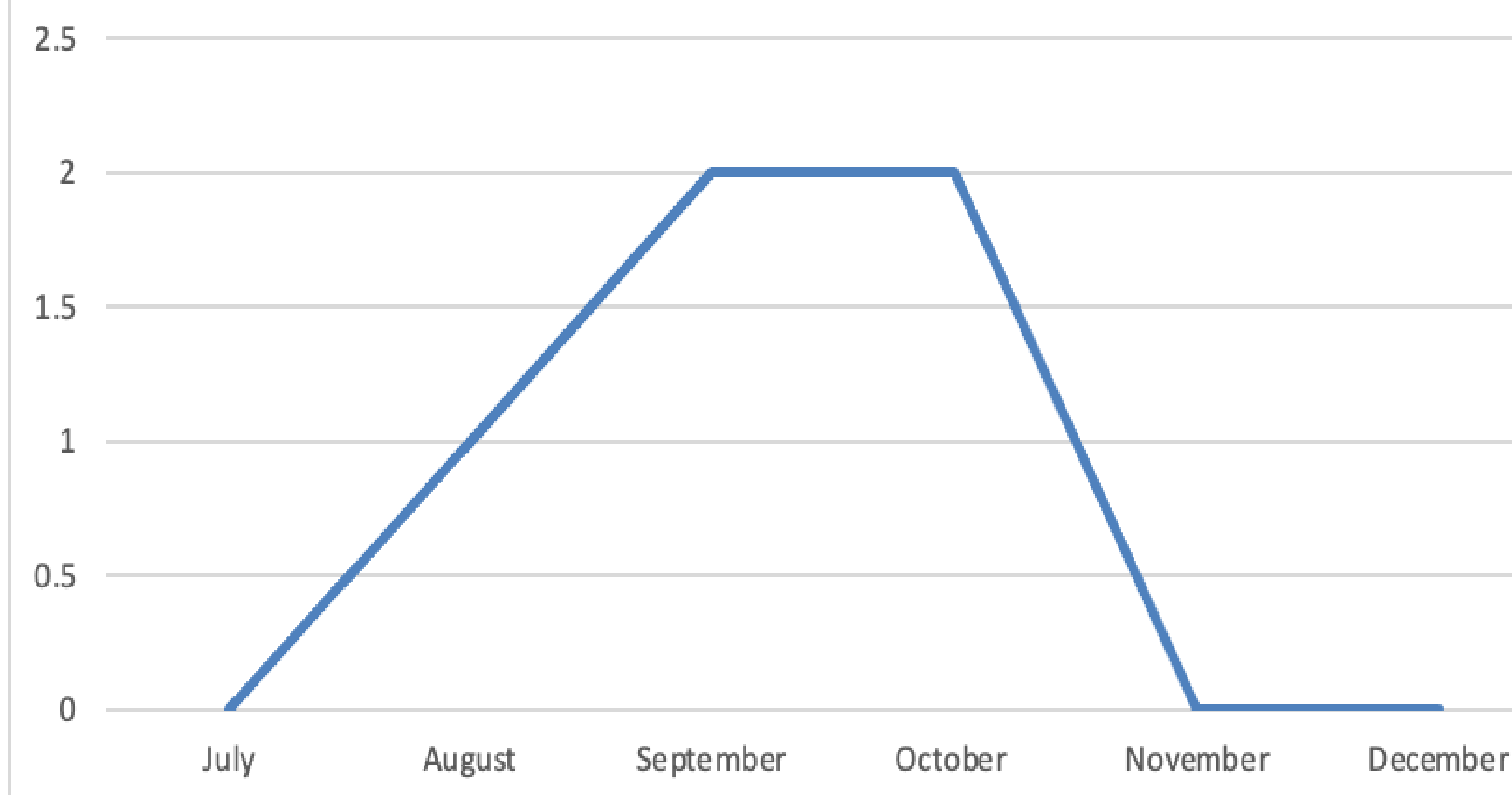
PATIENT CHARACTERISTICS

Patient	Month infection contracted (2021)	Age (years)	Sex	Length of stay (days)	Presenting illness	Organisms cultured	Treatment	Outcome
1	August	71	M	19	Subarachnoid bleed	<i>Klebsiella oxytoca</i>	Piperacillin-tazobactam	Discharged to skilled nursing facility
2	September	44	F	59	COVID-19 hypoxia	Carbapenem-resistant enterobacteriaceae and extended-spectrum beta-lactamase <i>E. coli</i>	Levofloxacin, piperacillin-tazobactam, and meropenem	Deceased
3	September	67	M	28	Hyponatremia	<i>Klebsiella pneumoniae</i>	Ceftriaxone and piperacillin-tazobactam	Discharged to skilled nursing facility
4	October	49	F	36	Spinal cord compression	Extended-spectrum beta-lactamase <i>E. coli</i>	Meropenem	Deceased
5	October	69	F	19	Tibia-fibula fracture	<i>Klebsiella pneumoniae</i>	Levofloxacin	Discharged home with outpatient follow-up

CAMERON COUNTY RATES OF COVID-19 INFECTION



Number of Catheter-Associated Urinary Tract Infections by Month



RESULTS

Between the months of July and December 2021:

- 5 CA-UTIs were contracted
- Patients ranged in age from 44 to 71 years old with a mean age of 68.8 years old
- 2 were male and 3 were female
- The average length of stay ranged from 19 to 59 days with an average stay of 32.2 days
- All patients had severe illness on presentation and multiple comorbidities.
- Organisms isolated included *klebsiella oxytoca*, carbapenem-resistant Enterobacteriaceae, extended-spectrum beta-lactamase *E. coli* and *klebsiella pneumoniae*.
- Susceptibility studies were conducted on all 5 patients.
- Antibiotics used include piperacillin-tazobactam, ceftriaxone, levofloxacin, and meropenem.
- CA-UTIs resolved in 4 patients; two of them were discharged to skilled nursing facilities, one was discharged home, and one died due to complications from COVID-19.
- Increased number of CA-UTIs corresponded with increased rates of COVID-19 contraction in Cameron County.

CONCLUSIONS

Among these cases, factors such as local rates of COVID-19 cases (the cases happened when hospital census was unusually high), extended length of stay, use of mechanical ventilation, Foley catheter placement in the Emergency Department, severe illness, and comorbid health conditions should be considered when assessing risk of CA-UTI and treatment outcome. While antibiotics that were prescribed appropriately corresponded with sensitivity studies, sustainability of infection prevention processes for the prevention of CA-UTIs is difficult to sustain during periods of crisis as exemplified in this project.

BIBLIOGRAPHY

Foxman B. The epidemiology of urinary tract infection. *Nat Rev Urol.* 2010;7(12):653–660.

Foxman B. Urinary tract infection syndromes: Occurrence, recurrence, bacteriology, risk factors, and disease burden. *Infect Dis Clin N Am.* 2014;28(1):1–13.

Nicolle LE. Catheter-associated urinary tract infections. *Antimicrob Resist Infect Control.* 2014;3:23.

STAT. 2022. *The COVID-19 Tracker.* [online] Available at: <<http://www.statnews.com/feature/coronavirus/covid-19-tracker/88>> [Accessed 23 January 2022].

Tenke P, Koves B, Johansen TE. An update on prevention and treatment of catheter-associated urinary tract infections. *Curr Opin Infect Dis.* 2014;27(1):102–107.

Weiner LM, Webb AK, Limbago B et al. Antimicrobial-resistant pathogens associated with healthcare-associated infections: Summary of data reported to the national healthcare safety network at the Centers for Disease Control and Prevention, 2011–2014. *Infect Control Hosp Epidemiol.* 2016;37(11):1288–1301.