

Trends In Antibiotic Resistance Among Uropathogens In The Pediatric Population: A Single Center Experience In The US

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Background

- Urinary tract infections (UTIs) are common infections in children.
- Overuse of antibiotics has led to an increasing prevalence of antibiotic resistance among uropathogens in adults.
- However, data on pediatric trends have not been previously reported.

Our objective was to characterize antibiotic resistance trends in uropathogens among children at a tertiary care hospital in a diverse urban US city.

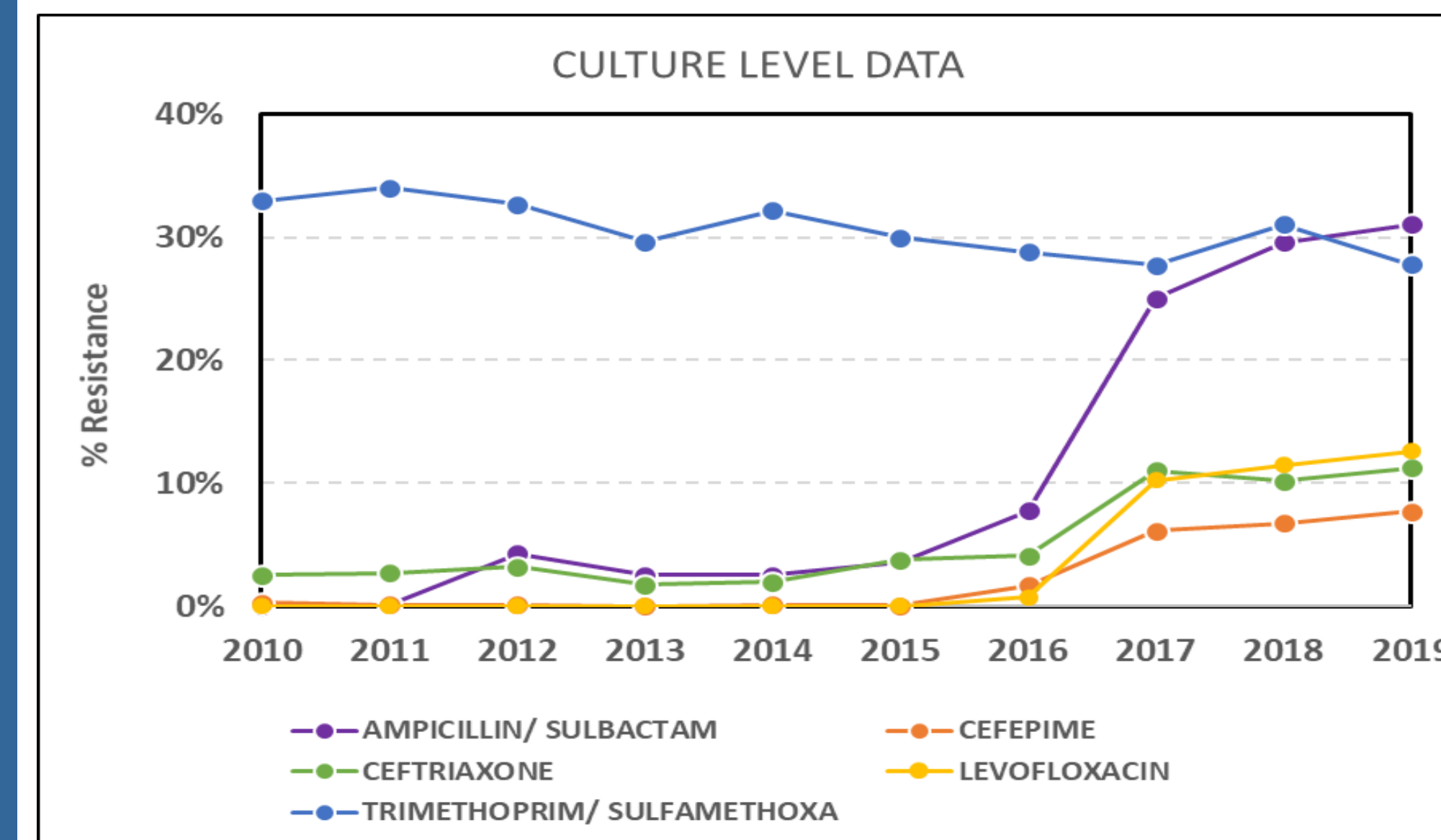
Methods

- Positive urine culture (>20,000 CFU/ml) data from children <18 years between January 1st, 2010 through December 31st, 2019 were obtained from the electronic medical records. Both inpatient and outpatient records were included.
- Yearly antibiotic agent-specific resistance rates were calculated based on culture, patient, and organism level data.

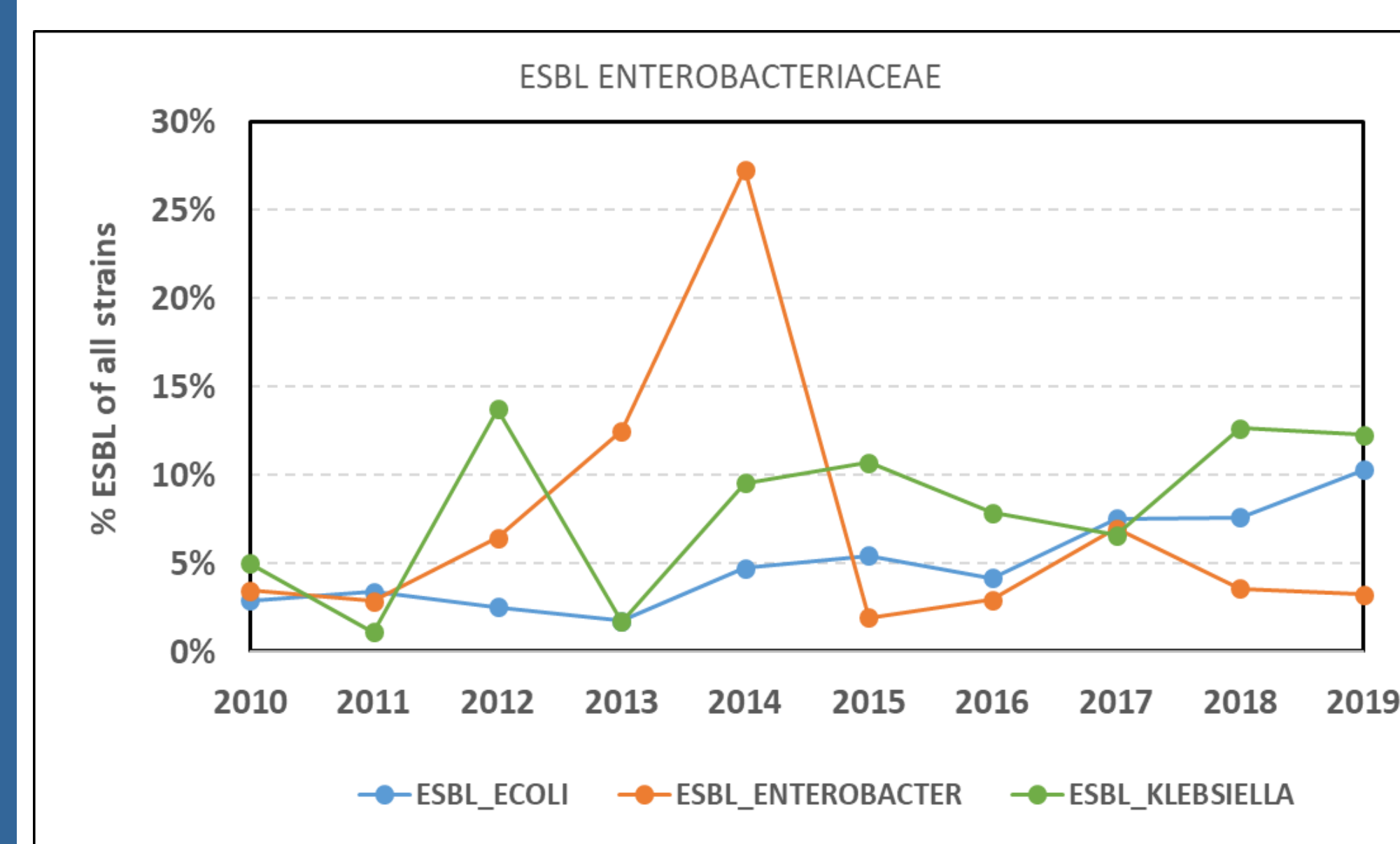
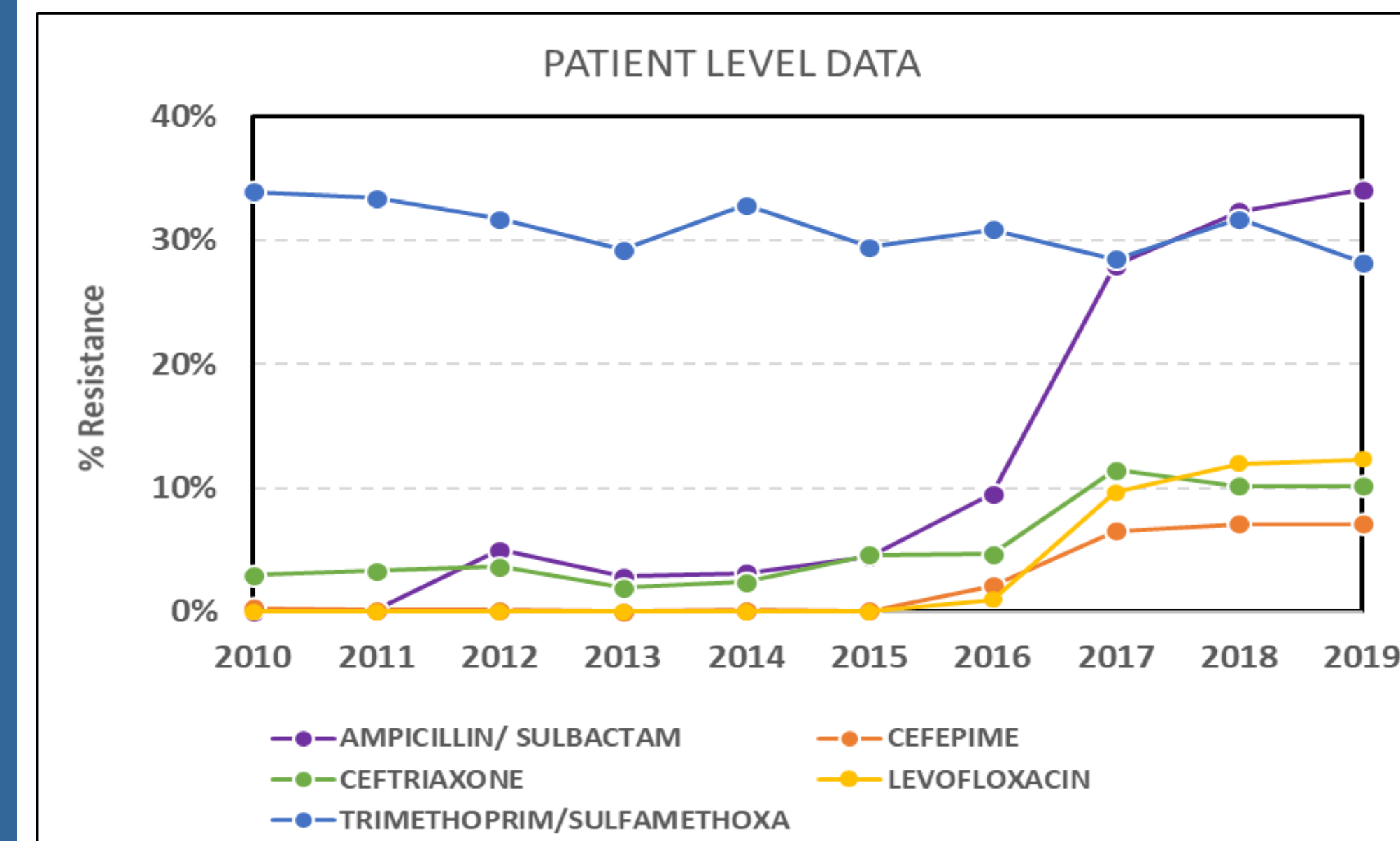
Results

- A total of 7,512 patients had ≥1 positive urine culture, with 13,327 positive individual cultures.
- *E. coli* (66%), *Klebsiella* (11%) and *Enterobacter* (4%) were most the most common isolates
- The average age was 6 yrs (IQR 2-11).
- 66% of isolates were resistant to at least 1 antibiotic.
- Increases in specific MICs to antibiotics mirrored resistance rates.
- Ampicillin resistance (50.1% IQR: 48.2%-52.4%) was the most common and remained stable over the study period.

Results



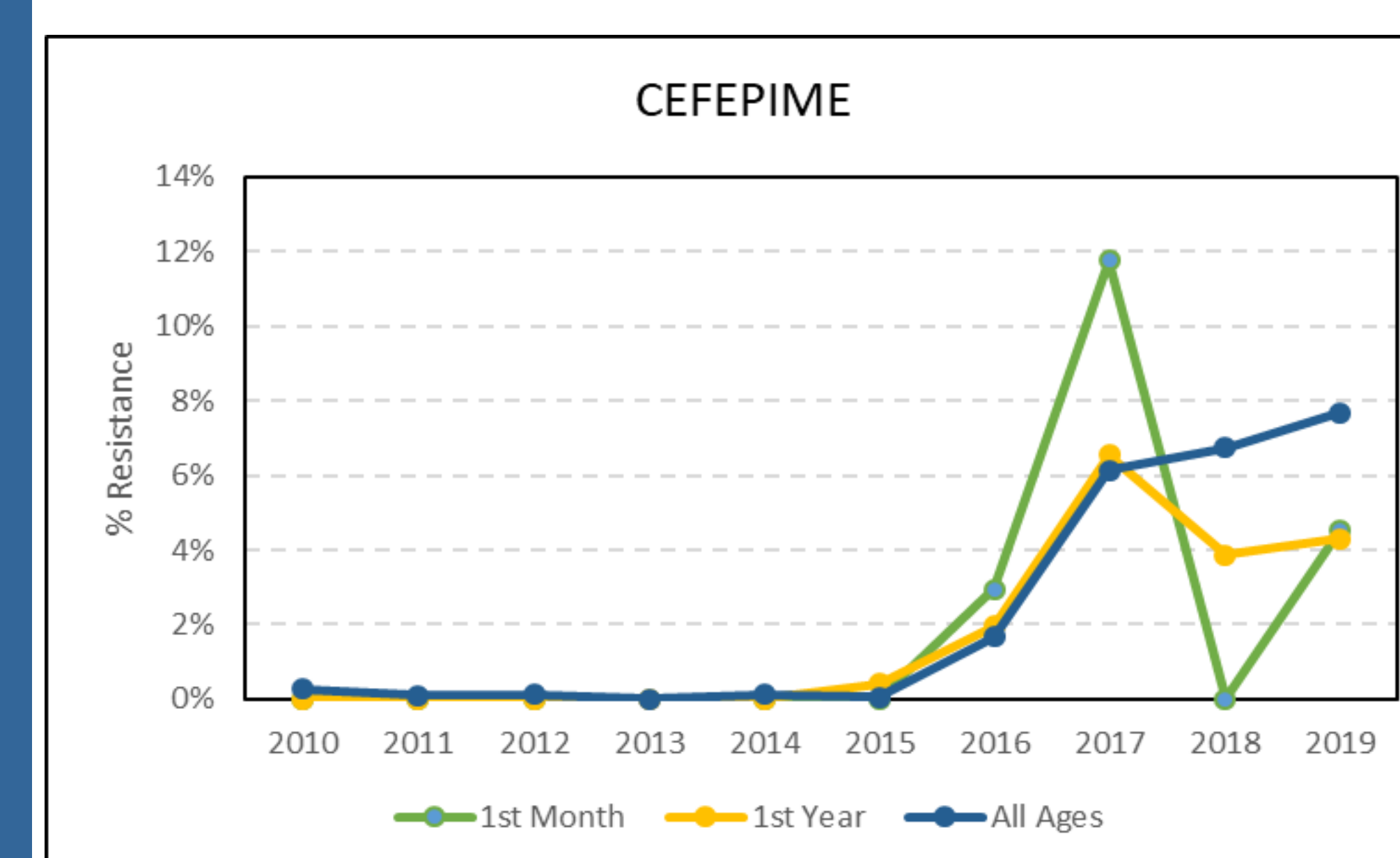
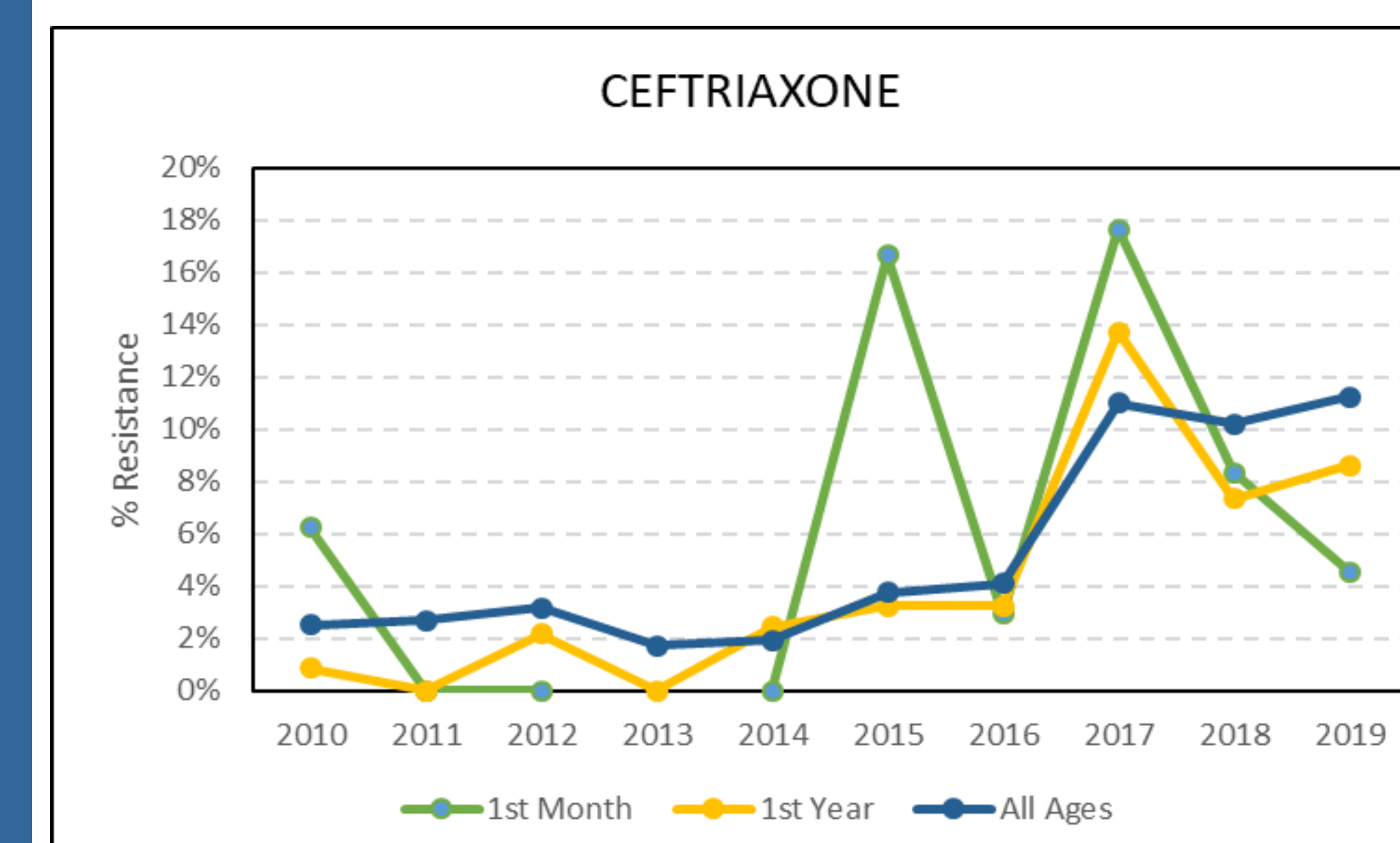
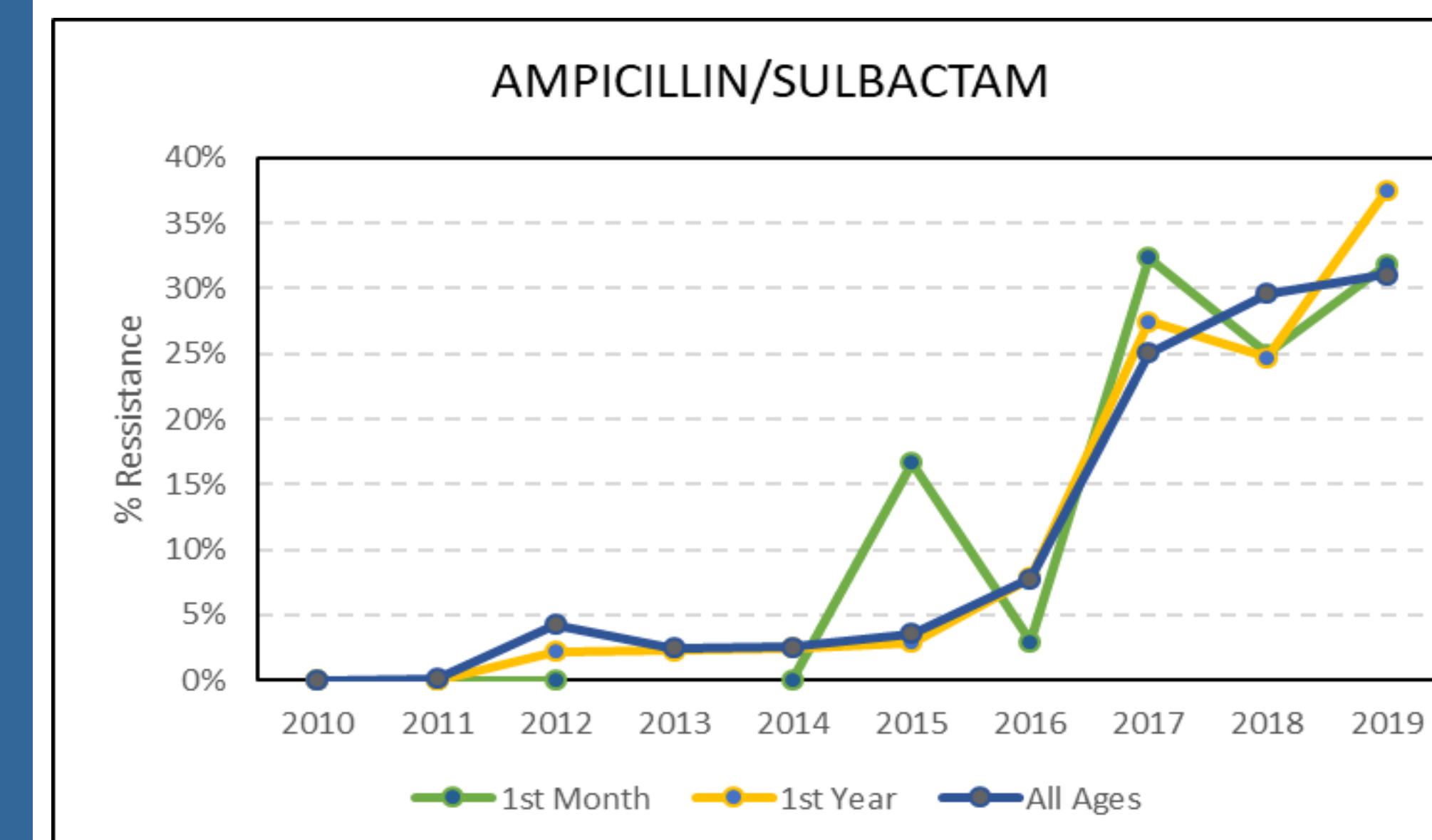
Trends for common antibiotics used to treat UTI. Culture (above) and patient (below) level data showed an increasing trend in resistance among most antibiotics, especially after 2015.



Corresponding increase in the prevalence of ESBL Enterobacteriaceae was also noted in the same time period.

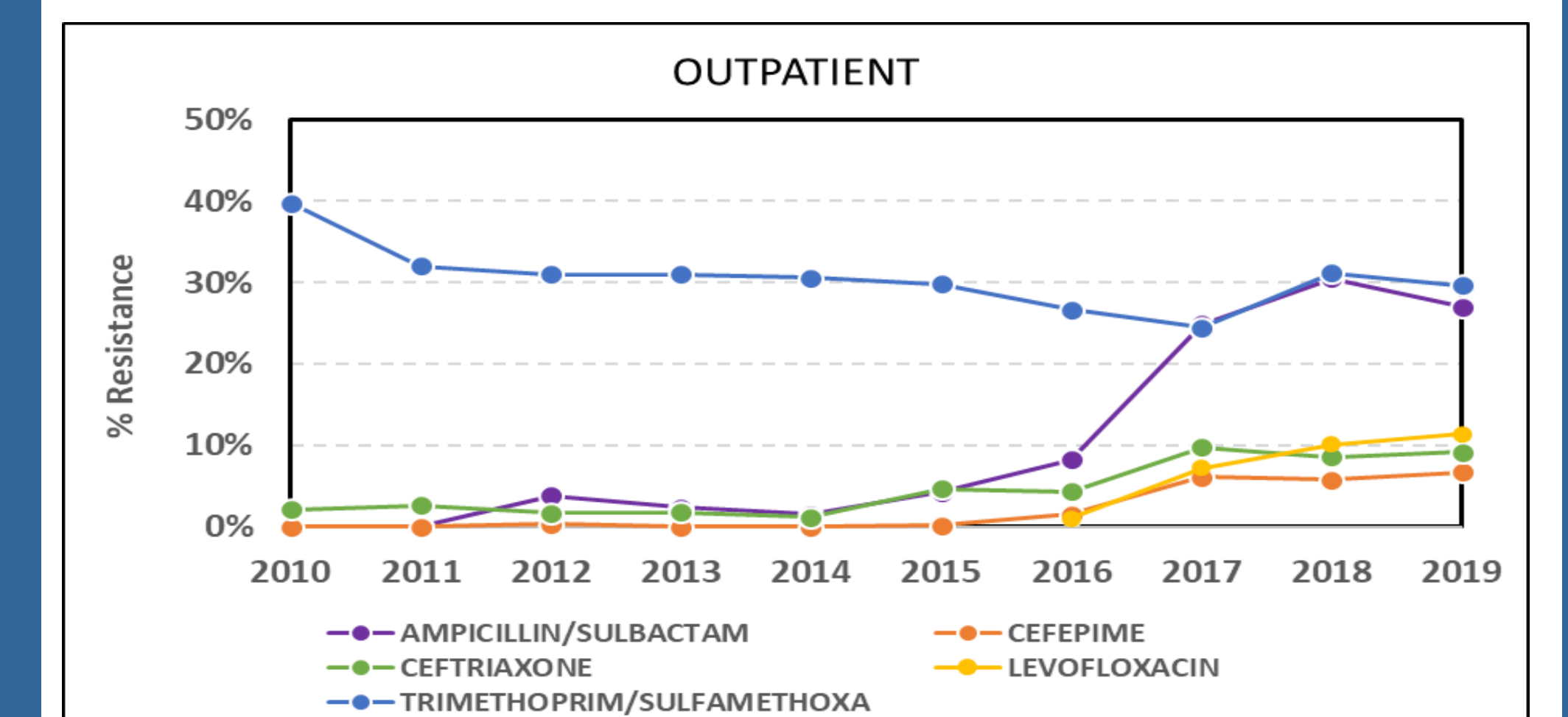
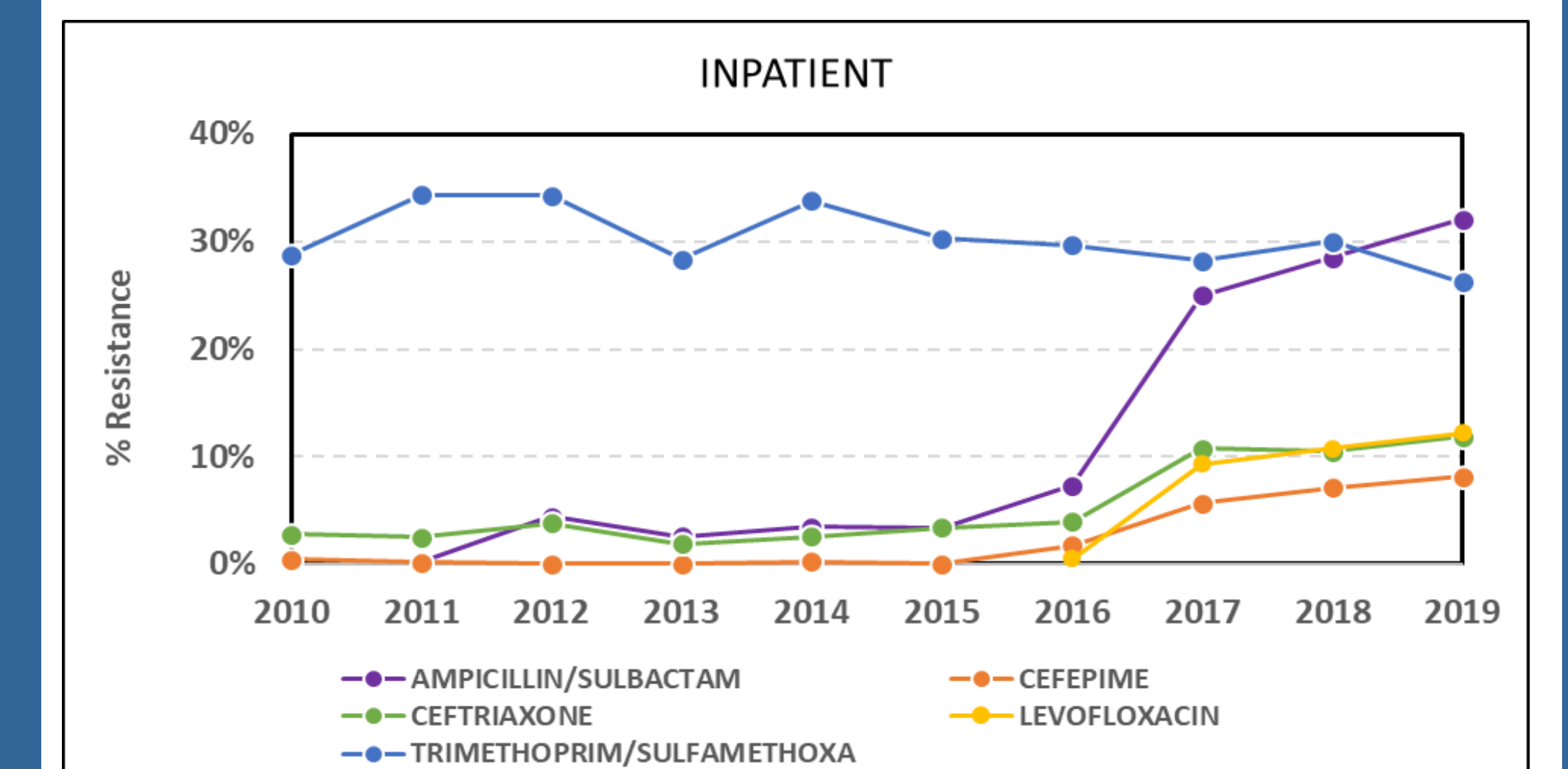
Results

Age related trends in resistance against common beta-lactam antibiotics. Interestingly, we noted that the rates of resistance against Ampicillin/Sulbactam, Ceftriaxone and Cefepime in infants <1 month and <1 year mirrored that of all children <18 years



Results

Resistance trends were similar among uropathogens collected from inpatient and outpatient settings



Conclusion

- There are rising rates of antibiotic resistance to broad spectrum antibiotics in the pediatric population over the last 10 years, with a notable increase in resistance starting in 2015-2016.
- While we were not able to distinguish patients with community acquired UTI, the increase in resistance among infants <1 year suggests a community reservoir of multi-drug resistant gram-negative bacteria.
- Colonization by resistant uropathogens has implications for empiric antibiotic choice, limited oral therapy options, and clinical outcomes which necessitate further study.