

## ABSTRACT

**Background:** Antimicrobial stewardship programs (ASPs) reduce the burden of multidrug-resistant organisms & improve antibiotic prescribing<sup>1</sup>. Concerns about drug-resistant pathogens (DRPs) in community-acquired pneumonia (CAP) lead to over-prescribing of broad-spectrum antibiotics, & ASP interventions to improve CAP prescribing are not well defined. In 2017, our hospital implemented a CAP guideline for patients at low risk for DRPs along with ASP support. The purpose of this study was to evaluate the impact of the guideline with ASP support on CAP-specific antibiotic prescribing.

**Results:** CAP-specific antibiotic administrations were 782 over the entire study period, with 764, 771, & 928 administrations observed before phase A, after A, & after B, respectively. Macrolide consumption increased after the guideline (p=0.029). We observed a significant step change decrease in FQ consumption was observed after phase A) (p=0.039) and a positive upward trend in oral alternatives agents after phase B (p=0.090), as shown (Figure). Consumption of broad Gram-negative agents & vancomycin/linezolid were not significantly different after the guideline.

**Conclusion:** Implementation of a CAP guideline with patient-specific & DRP risk factors was associated with significant changes in CAP-specific prescribing. Changes in prescribing were temporally associated with ASP interventions. Additional studies into the impact of this guideline on correct classification of Gram-negative resistance & clinical outcomes are needed.

## INTRODUCTION

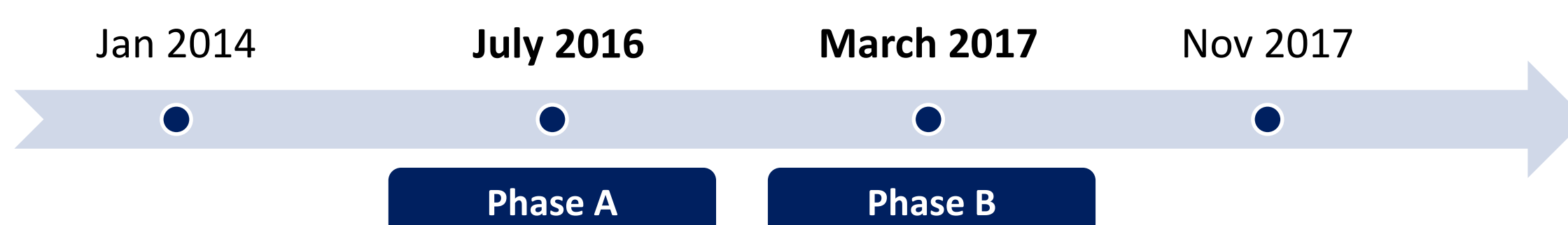
- Optimal ASP interventions for CAP are poorly defined
- Confusion about antibiotic resistant pathogens in CAP and patient-specific risk factors for resistance may contribute to inappropriate selection of broad-spectrum agents<sup>2</sup>
- Healthcare-associated pneumonia (HCAP) abolished due to poor predictive performance of the criteria and failure of broad-spectrum agents to significantly improve outcomes<sup>2,3</sup>
- Patients with HCAP risk factors are a population at high risk for antibiotic-associated adverse events like CDI<sup>4</sup>
- NMH Antimicrobial Stewardship Program initiatives
  - July 2016 – Prospective audit and feedback (Phase A)
  - March 2017 – non-ICU CAP Guidelines (Phase B)

## OBJECTIVE

- Determine the impact of an ASP driven CAP guideline with education and prospective intervention on CAP-specific prescribing

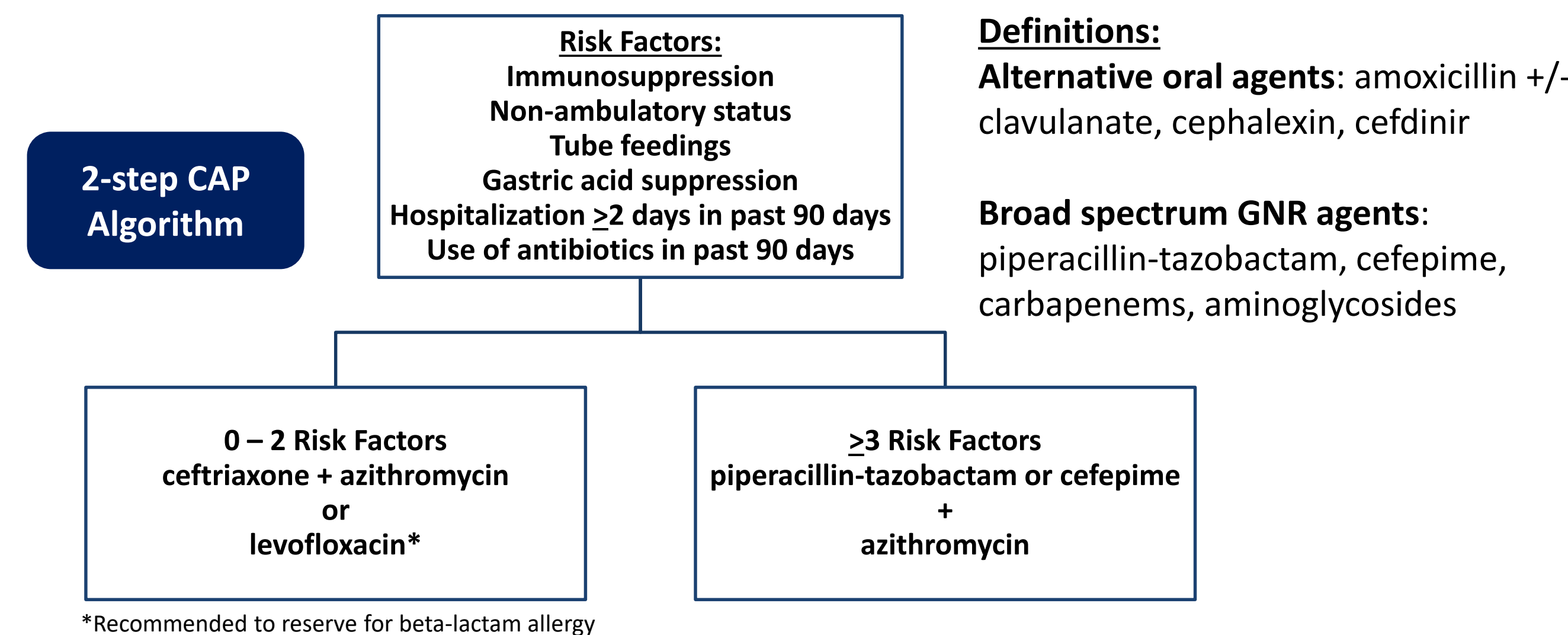
## METHODS

- Quasi-experimental, interrupted time series<sup>5</sup> at the facility-wide level
- CAP-specific antibiotic consumption (administrations)
- Statistical analysis – interrupted time series segmented-regression analysis
- All statistical models and plots were generated using Microsoft Excel 2016 (Redmond, WA)



## METHODS

Figure 1.



## RESULTS

Figure 2.

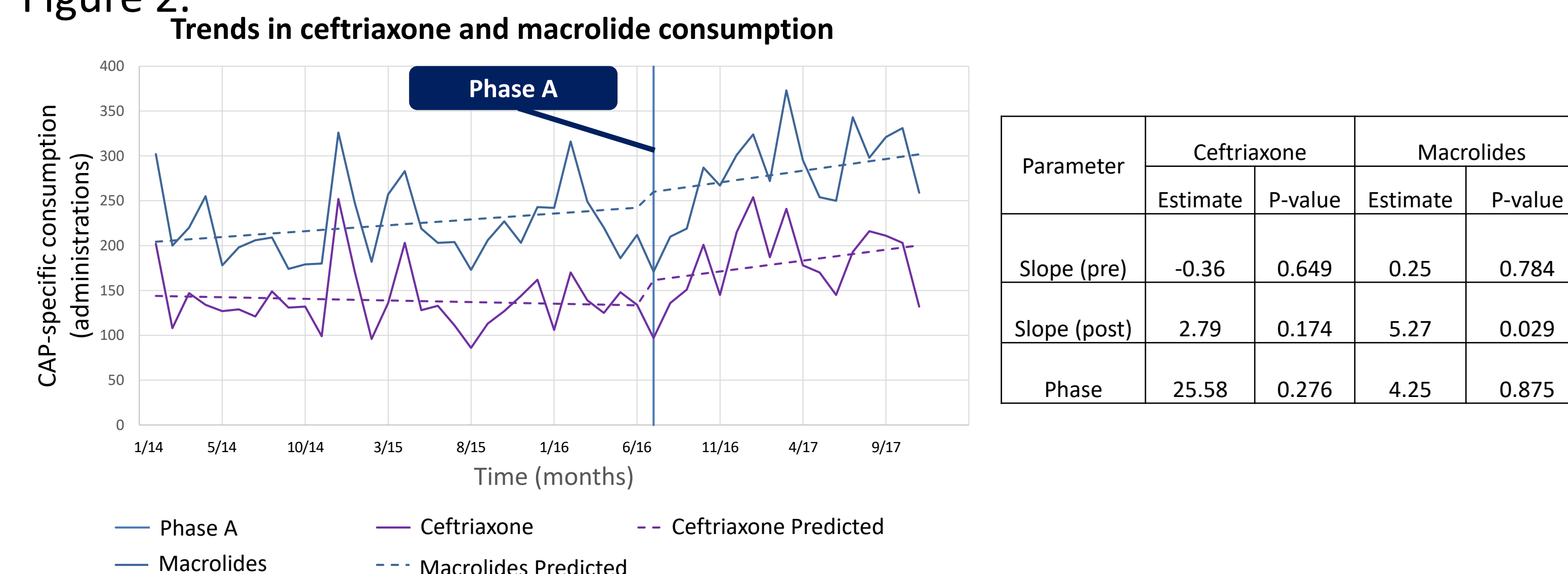
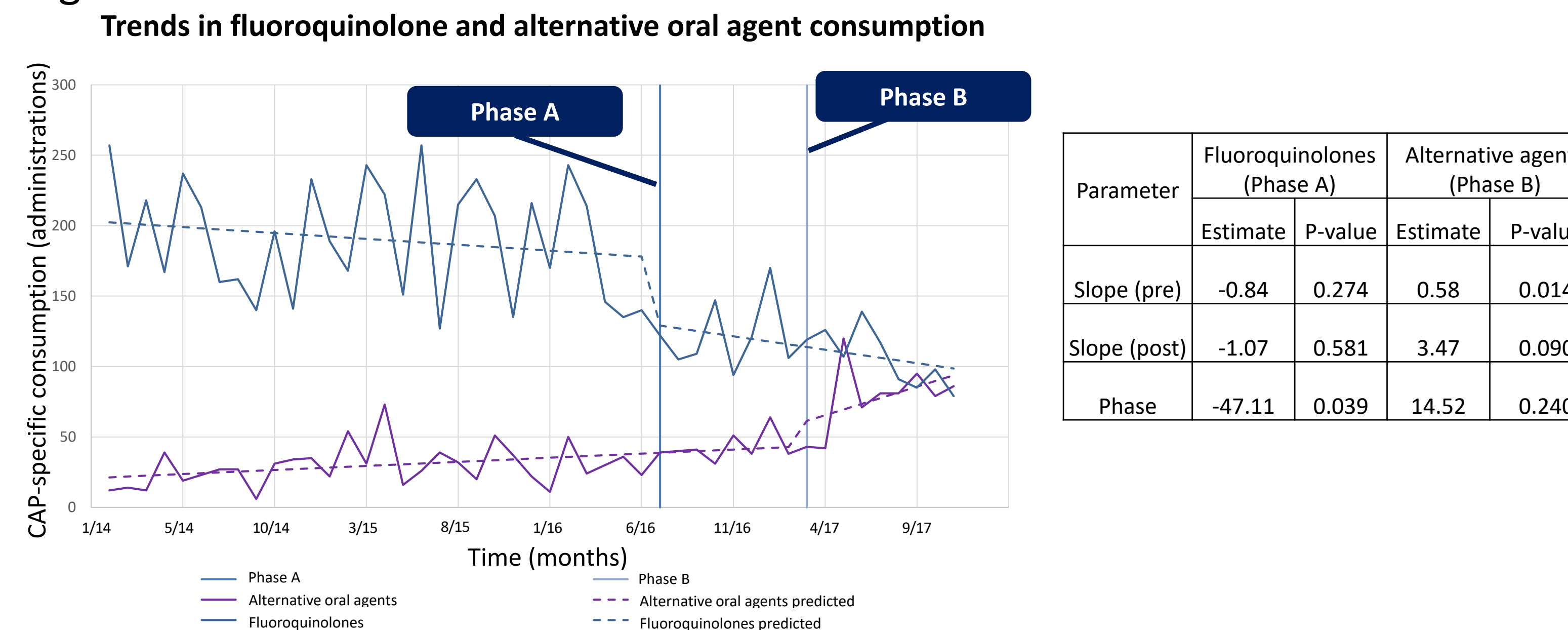
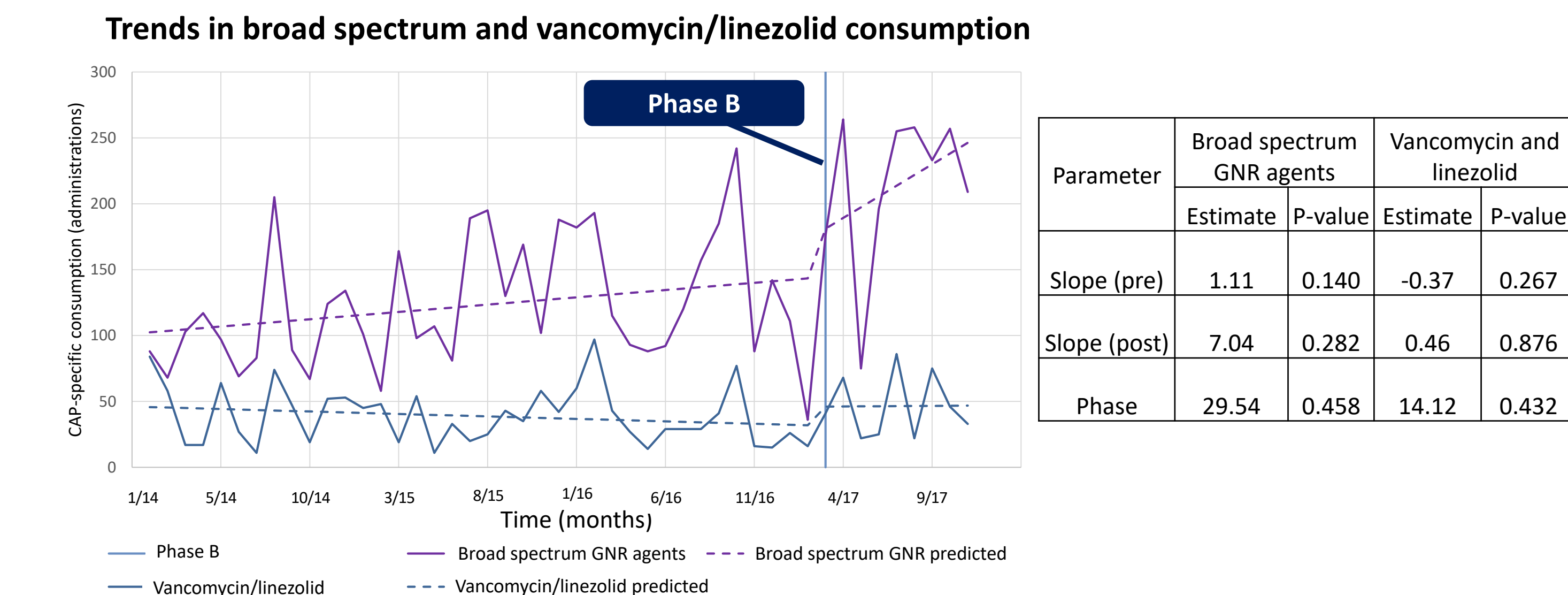


Figure 3.



## RESULTS

Figure 4.



- Increase in baseline trend of consumption for macrolides after ASP Phase A (p=0.029)
- Step-change reduction of fluoroquinolone consumption after ASP Phase A (p=0.039)
- Non-significant increase in overall trend of alternative oral agent consumption (p=0.090)

## CONCLUSION

- NMH CAP Guideline resulted in significant changes in prescribing for select agents that were temporally associated with stewardship initiatives
- Decrease in consumption of fluoroquinolones was met with an increase in use of alternative oral agents recommended for treatment of CAP
- Additional studies into the impact of this guideline on correct classification of Gram-negative resistance and mortality are warranted

## REFERENCES

1. The Joint Commission. Approved: New Antimicrobial Stewardship Standard. Medication Management Standard (MM.09.01.01). 2017.
2. Shindo Y, Ito R, Kobayashi D, et al. Risk factors for drug-resistant pathogens in community-acquired and healthcare-associated pneumonia. Am J Respir Crit Care Med 2013;188(8):985-995.
3. Jain S, Self WH, Wunderink RG, et al. Community-Acquired Pneumonia Requiring Hospitalization among U.S. Adults. N Engl J Med 2015;373(5):415-427.
4. Chalmers JD, Akram AR, Singanayagam A, et al. Risk factors for Clostridium difficile infection in hospitalized patients with community-acquired pneumonia. J Infect 2016;73(1):45-53.
5. Lopez Bernal J, Cummins S, Gasparrini A. Interrupted time series regression for the evaluation of public health interventions: a tutorial. Int J Epidemiol 2017;46:348-55.

## DISCLOSURES

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation – All authors: no relevant disclosures.