

Retrospective Review of Drug Resistance in Pneumonia Score Recommendation and Antibiotic Selection for Patients in the Emergency Department with Community Acquired Pneumonia



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Background

- 1.5 million adults are hospitalized annually from CAP.¹
- The 2019 CAP guidelines recommend empiric treatment with a beta-lactam-macrolide combination or respiratory fluoroquinolone in the absence of risk factors for drug resistant pathogens (DRP).²
- Emerging drug resistance can lead providers to empirically select broad spectrum antibiotics with MRSA and Pseudomonas coverage.
- The DRIP Score provides clinical decision support to determine which patients are at risk for drug resistant pathogens and should receive broad spectrum antibiotics.³
- DRIP Scores are calculated based on major and minor risk factors.⁴
- Major Risk Factors (2 points)**
 - Prior antibiotic use
 - Residence in a long-term care facility
 - Tube feeding
 - Prior history of drug resistance
- Minor Risk Factors (1 point)**
 - Prior hospitalization
 - Chronic pulmonary disease
 - Poor functional status
 - Prior use of a PPI or H2 blocker
 - Active wound care
 - Prior MRSA colonization
- A score of ≥ 4 suggests the patient is at risk for DRP and empiric therapy should include MRSA and Pseudomonas coverage.⁴

Purpose

Compare current empiric antibiotic selection for CAP at LMH Health to antibiotic recommendation based on DRIP score

Primary Outcome:

- The percentage of patients who received antibiotics consistent with the DRIP score recommendation.

Secondary Outcomes:

- The number of patients whose calculated DRIP score was ≥ 4 .
- The number of patients who received broad spectrum antibiotics.
- The percentage of patients whose antibiotic spectrum changed after they were admitted.

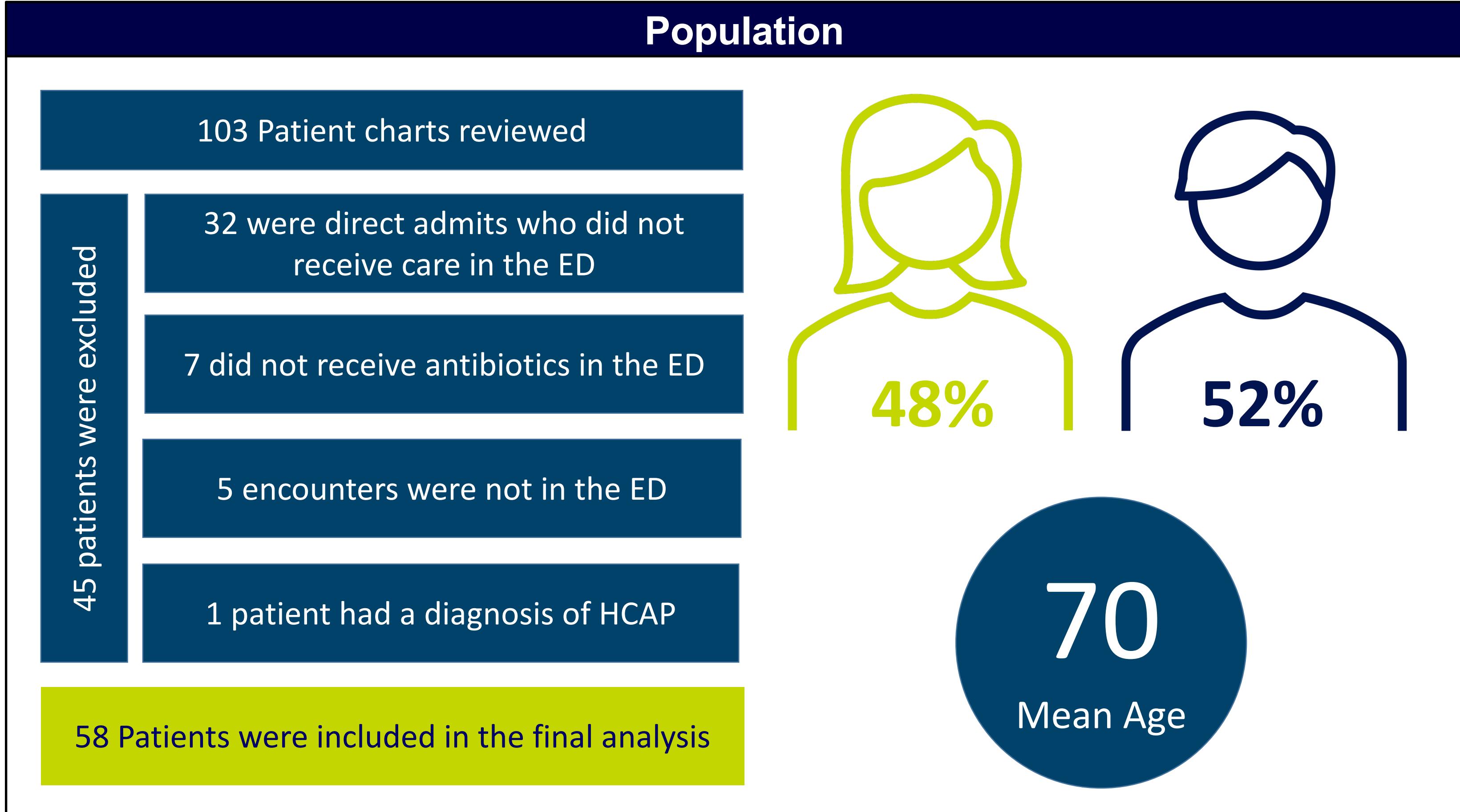
Methods

- This retrospective study took place at LMH Health a 174-bed community hospital with 38,000 annual ED visits.
- 411 unique adult patient encounters were identified during the study period.
- Every fourth encounter when arranged chronologically by date of admission was selected for a chart review.
- Patients 18 years and older, diagnosed with community acquired pneumonia, who received antibiotics in the ED and were admitted between October 2019 and March 2020 were included in this study.
- Patients were excluded if there was insufficient information to calculate a DRIP score.

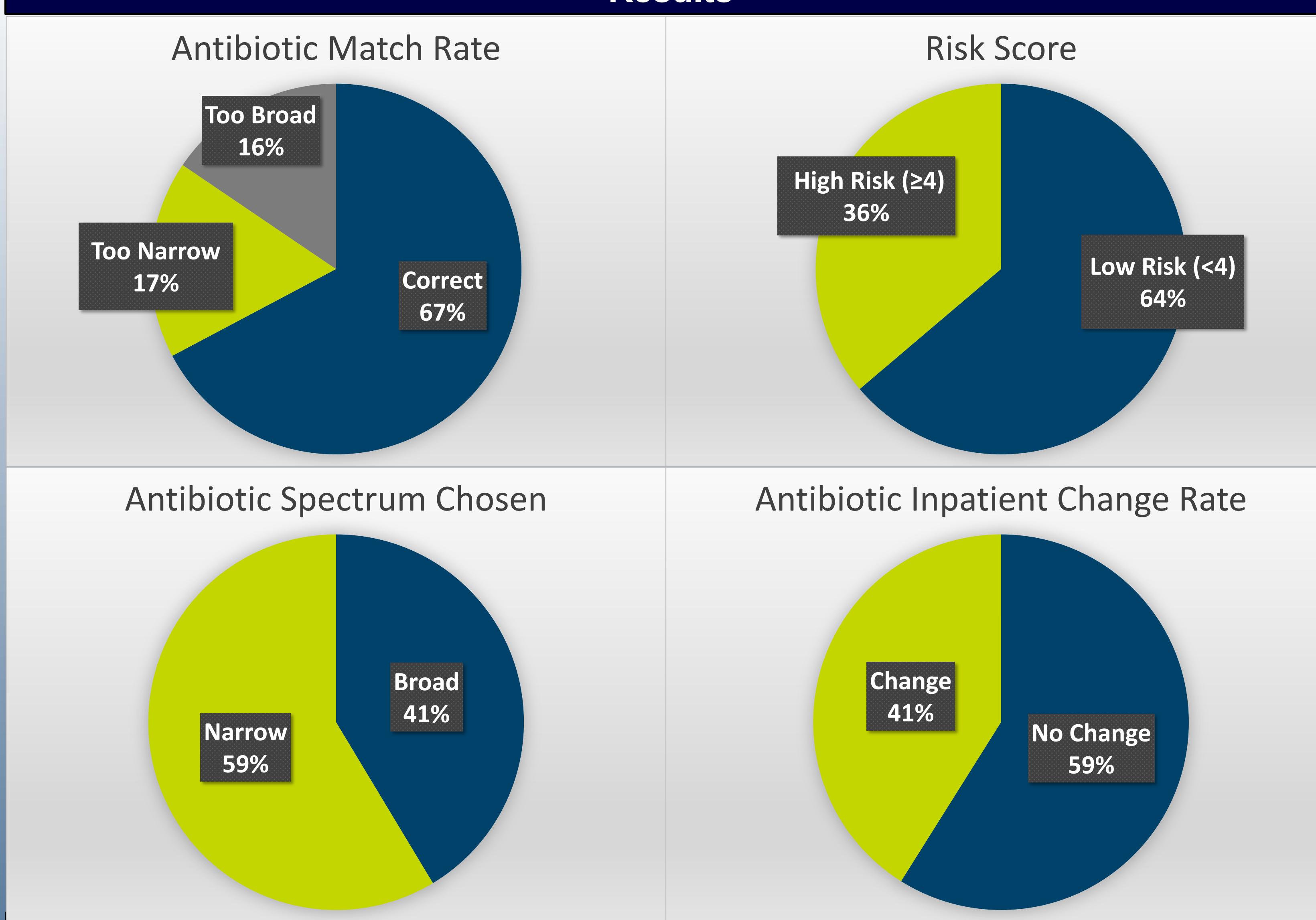
Disclosure

The authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter.

Population



Results



- Of the 58 patients included, 39 received antibiotics in line with the DRIP score recommendation.
- A Chi Square analysis ($\chi^2=0.42$) showed no statistically significant difference between the current practice and DRIP score recommendation ($p=0.52$).
- The majority of patients (64%) had a DRIP score less than 4, with the most common major risk factors being prior use of antibiotics and residence in a long-term care facility.
- When broad spectrum antibiotics were chosen, the most common were Zosyn (9%) and vancomycin (6%).
- 41% of patient's therapy changed after being admitted to the hospital.
 - 47% of these receiving broader antibiotics and 53% received more narrow antibiotics.

Discussion

- Although not statistically significant, there is room to better align with DRIP Score recommendations in CAP treatment.
- The incorrect antibiotic choices were evenly distributed between too broad and too narrow. This indicates that the ED providers are not consistently over treating or under treating patients.
- During the transition of care from ED providers to hospitalists, it was common for therapy to change. This could be due to the lack of a systematic way of selecting empiric therapy in the ED. There was no trend of hospitalists changing to more narrow or more broad antibiotics.

Limitations:

- History of MRSA or drug resistant pneumonia was not clearly documented on each patient
 - The absence of information was classified as a negative history
- All patients were coded with ICD J18.9 but the diagnosis description varied. Descriptions of "Pneumonia" and "Community Acquired Pneumonia" were included
- The COVID-19 Pandemic may have confounded diagnosis and antibiotic selection due to severity of illness
- LMH Health has an ED Pharmacist present from 06:30 to 23:00. This study failed to capture if a pharmacist was involved in antibiotic selection.

Conclusion

- LMH Health currently does not have a standard protocol or EHR decision support established for selection of empiric antibiotic selection in CAP. This analysis shows that while 33% of patients received antibiotics not in line with DRIP Score recommendations, there was no statistical trend towards over treating.

Next Steps

- Educate pharmacists and providers on the use of the DRIP Score for selection empiric antibiotics in CAP
- Implement EHR clinical decision support utilizing the DRIP Score to guide antibiotic selection
- Further research needed to determine if implementing the DRIP score in our ED would decrease the percentage of patients whose antibiotic spectrum changed after they were admitted.

References

- Ramirez JA, Wiemken TL, Peyrani P, et al. Adults Hospitalized With Pneumonia in the United States: Incidence, Epidemiology, and Mortality. Clin Infect Dis 2017; 65:1806.
- Metlay, J. P., Waterer, G. W., Long, A. C., Anzueto, A., Brozek, J., Crothers, K., Cooley, L. A., Dean, N. C., Fine, M. J., Flanders, S. A., Griffin, M. R., Metersky, M. L., Musher, D. M., Restrepo, M. I., & Whitney, C. G. (2019). Diagnosis and Treatment of Adults with Community-acquired Pneumonia. An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. American journal of respiratory and critical care medicine, 200(7), e45–e67. <https://doi.org/10.1164/rccm.201908-1581ST>
- Webb BJ, Dascomb K, Stenehjem E, Holenarasiip VR, Agrwal N, Sakata K, Williams K, Bockorny B, Bagavathy K, Mirza S, Metersky M, Dean N. Derivation and Multicenter Validation of the Drug Resistance in Pneumonia Clinical Prediction Score. Antimicrobial Agents and Chemotherapy April 2016; 60 (5) 2652-2663.
- Webb, B. J., Sorensen, J., Mecham, I., Buckel, W., Ooi, L., Jephson, A., & Dean, N. C. (2019). Antibiotic Use and Outcomes After Implementation of the Drug Resistance in Pneumonia Score in ED Patients with Community-Onset Pneumonia. Chest, 156(5), 843–851. <https://doi.org/10.1016/j.chest.2019.04.093>