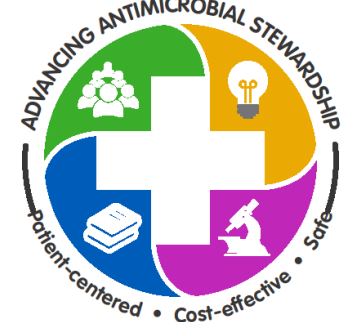
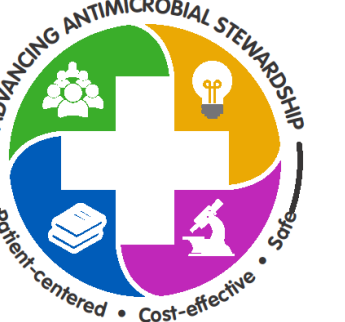


Repeat Tracheal Aspirates in Pediatric Intensive Care Patients: Frequency, Resistance and Antimicrobial Use



Edward Lyon DO, MA; Jennifer Goldman MD, MSCR; Brian Lee PhD, MPH; Margaret Campbell, MD; Rangaraj Selvarangan BVSc, PhD, D(ABMM), FIDSA, F(AAM); Elizabeth Monsees PhD, MBA, RN, CIC, FAPIC



Children's Mercy Kansas City

Introduction

- Tracheal aspirates (TA) are obtained in the PICU on intubated or tracheostomy dependent patients
 - Ordered when clinical changes occur
 - Are challenging to interpret leading to:
 - Colonization vs new infection?
 - Clinically useful results?
- UNKNOWN: Frequency of patients who have more than 1 TA collected during a single PICU admission**

Objectives

- Determine frequency of repeat TAs
- Calculate frequency of multi-drug resistant organisms (MDRO)
- Develop a bacterial profile of pathogens
- Examine antibiotic use
- Understand clinical reasons for collection

Methods

- Retrospective chart review
- 63 patients admitted between 2018 - 2019 with ≥ 2 TA cultures
- 256 TA cultures met criteria for inclusion
- Collected: microbiology, antibiotic susceptibilities, antibiotic exposure, and patient condition
- Descriptive statistics to calculate frequency of repeat TA collection, time between collections, reason for collection and MDRO frequency

Results

Table 1 Demographic Information		
Sex		
Male	0.65	N = 41
Female	0.35	N = 22
Age		
<1yr	0.29	N = 18
1yr-5yr	0.40	N = 25
>5yr	0.32	N = 20
Race		
White	0.65	N = 41
Black	0.14	N = 9
Hispanic	0.14	N = 9
Multi-Racial	0.03	N = 2
Other	0.03	N = 2
Admitting Service		
Medical ICU	0.71	N = 45
Cardiac ICU	0.29	N = 18
Length of Stay		
Median	43 days	[20, 116.5]
Average	108 days	

Figure 1. Number of Tracheal Aspirate Cultures per patient

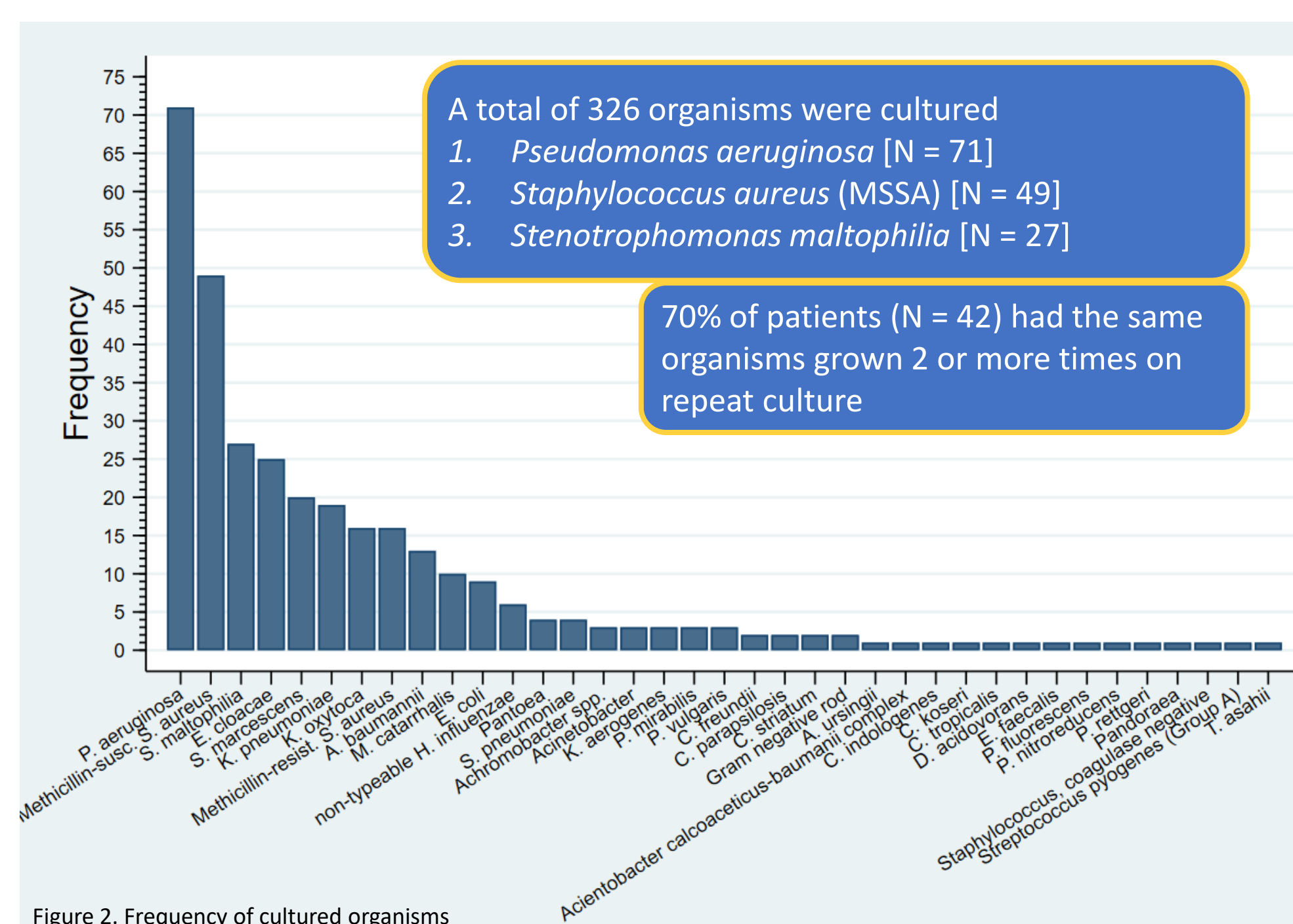
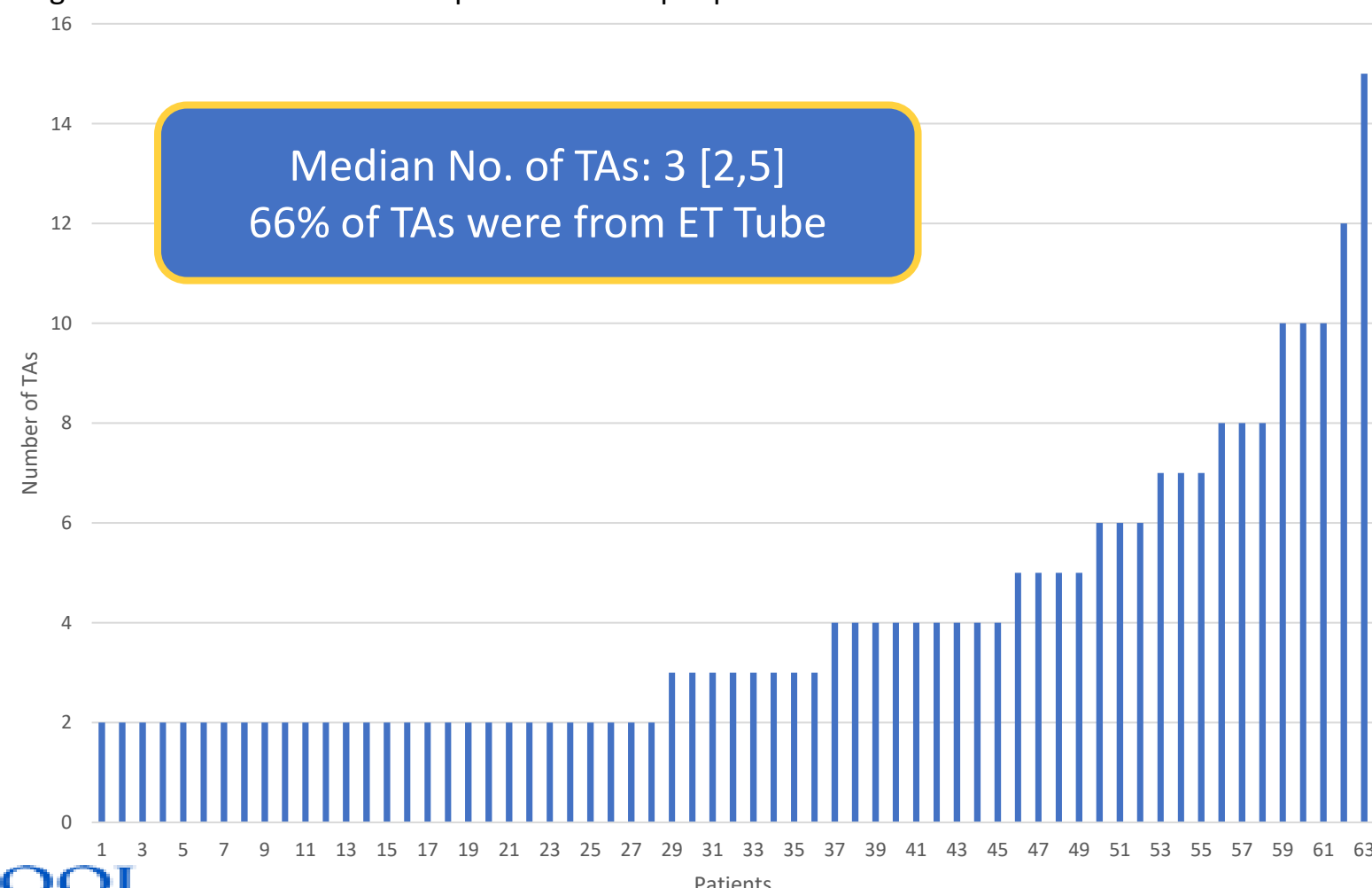


Figure 2. Frequency of cultured organisms

Figure 3. Time between tracheal aspirate cultures

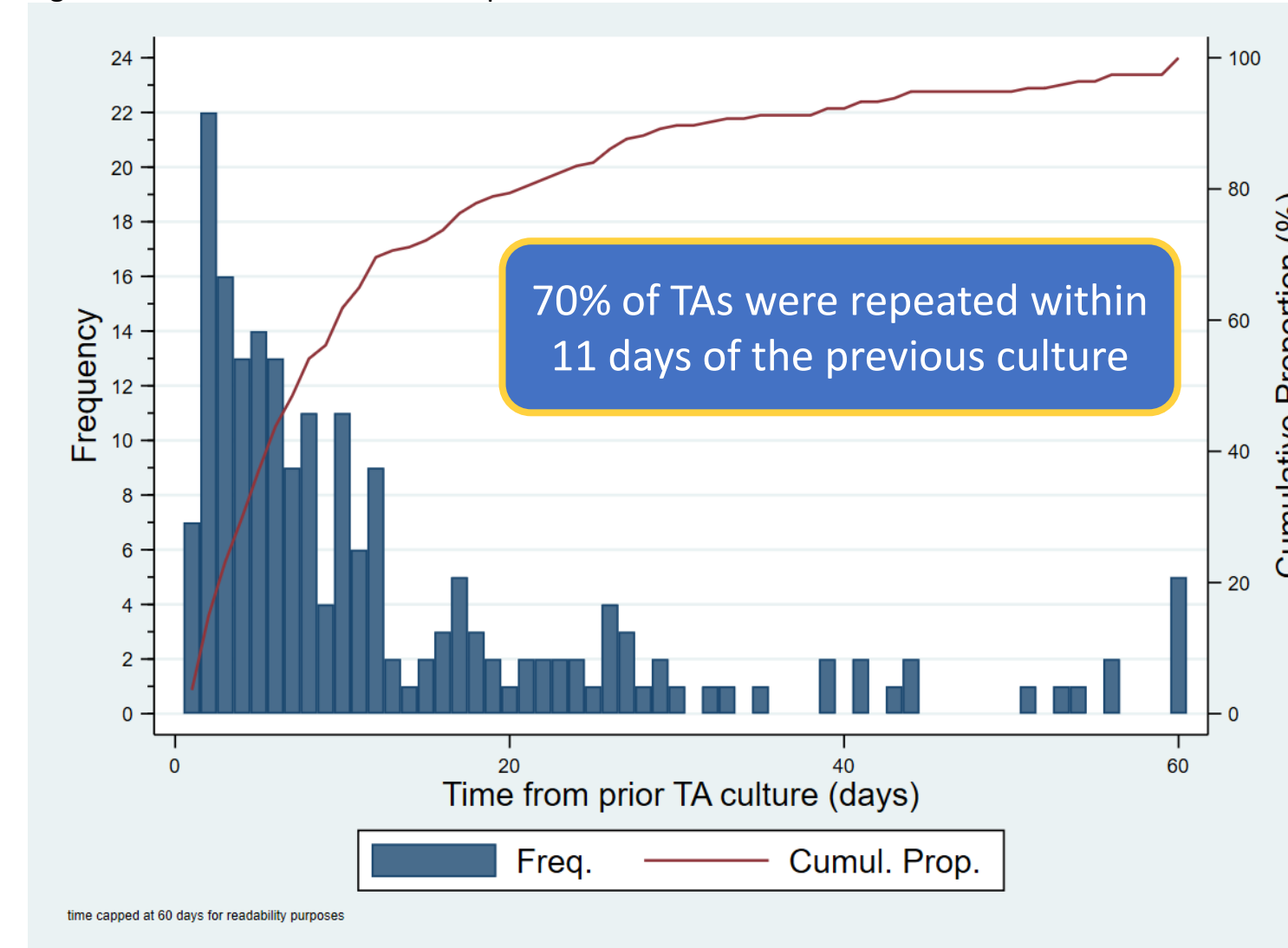
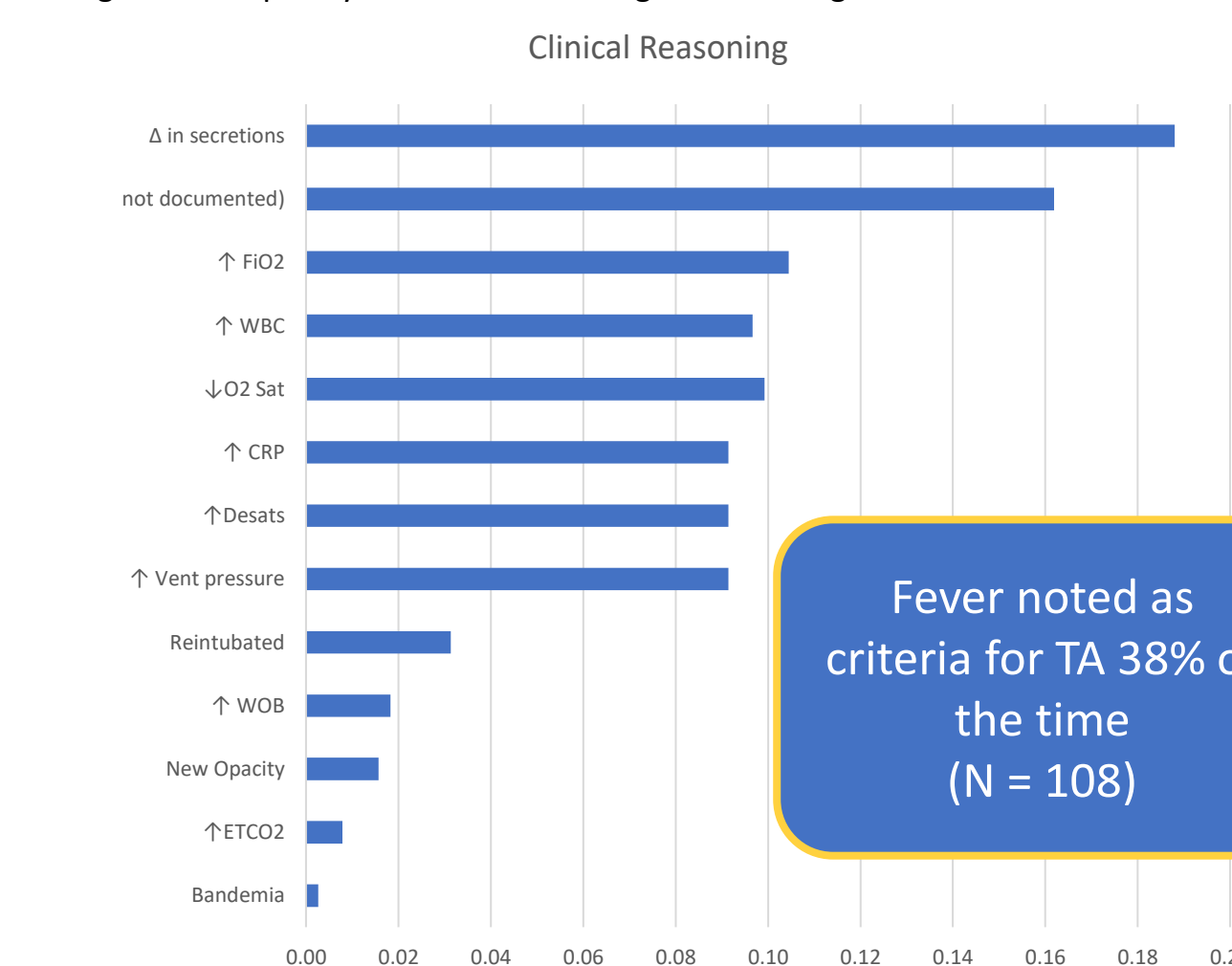


Table 2 Antibiotic Exposure and ASP intervention		
Antibiotic Days		Percentage
Total Days	1517 days	
Days for treatment of TA	447 days	29%
Resistance Development		Percentage
TAs with resistance	N = 16	25%
Median Antibiotic Days Before Resistance		IQR
4x MIC increase (N =12)	19 days	[12, 24]
MDRO (N=4)	48 days	[29, 60]
Antibiotic Stewardship Involvement and Intervention		Percentage
No. of TAs Reviewed	N = 124	48%
No. with ASP Recommendation	N = 46	18%
Antibiotic Stewardship Recommendations		Percentage
Stop Antibiotic	N = 6	13%
Change Antibiotic Type	N = 16	35%
Change duration or dose	N = 11	24%
Obtain ID consultation	N = 13	28%

Figure 4. Frequency of clinical reasoning for obtaining TA culture



Discussion

- Frequency of repeat TA is high
- Frequency of the same pathogen cultured in repeat samples is high
- Development of antibiotic resistance is common
 - Found in 25% of cultures
- Only 29% of TAs are treated with antibiotics

Next Steps

- Develop standard work and collaborative process measures with PICU partners
- Consider algorithm to guide:
 - Modified clinical pulmonary infection score application
 - Minimum duration between cultures
- Continue stewardship work to shorten length of therapy, when appropriate

