



# Staphylococcus aureus Bacteremia: Does Intravenous Drug Use Impact Quality of Care and Clinical Outcomes?

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## Background

- People who inject drugs (PWID) have higher risk for *Staphylococcus aureus* bacteremia (SAB) and increased management complexity.<sup>1</sup>
- SAB is associated with high healthcare costs, long hospital stays, and a 20% 30-day mortality rate.<sup>2</sup>

## Objectives

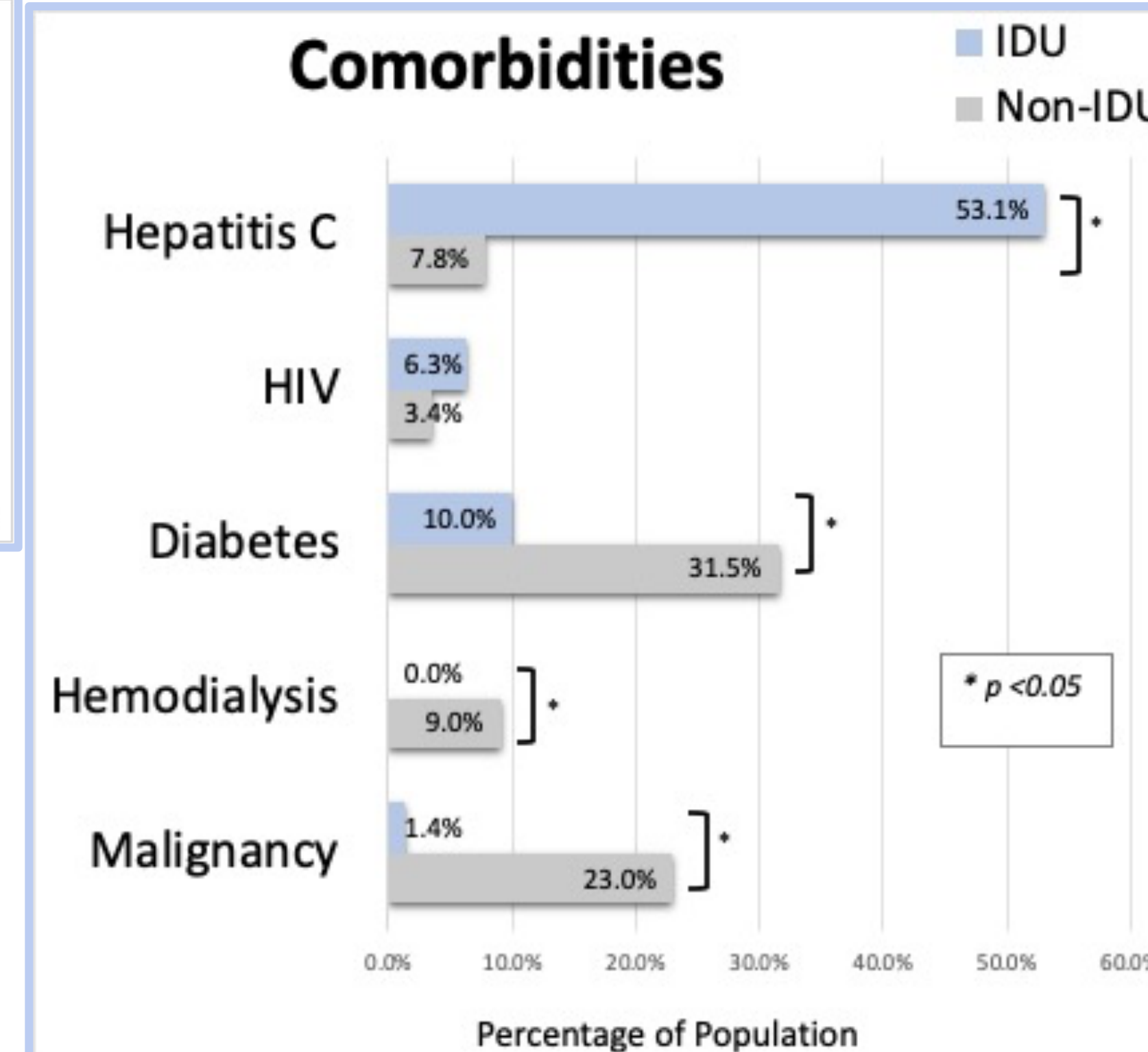
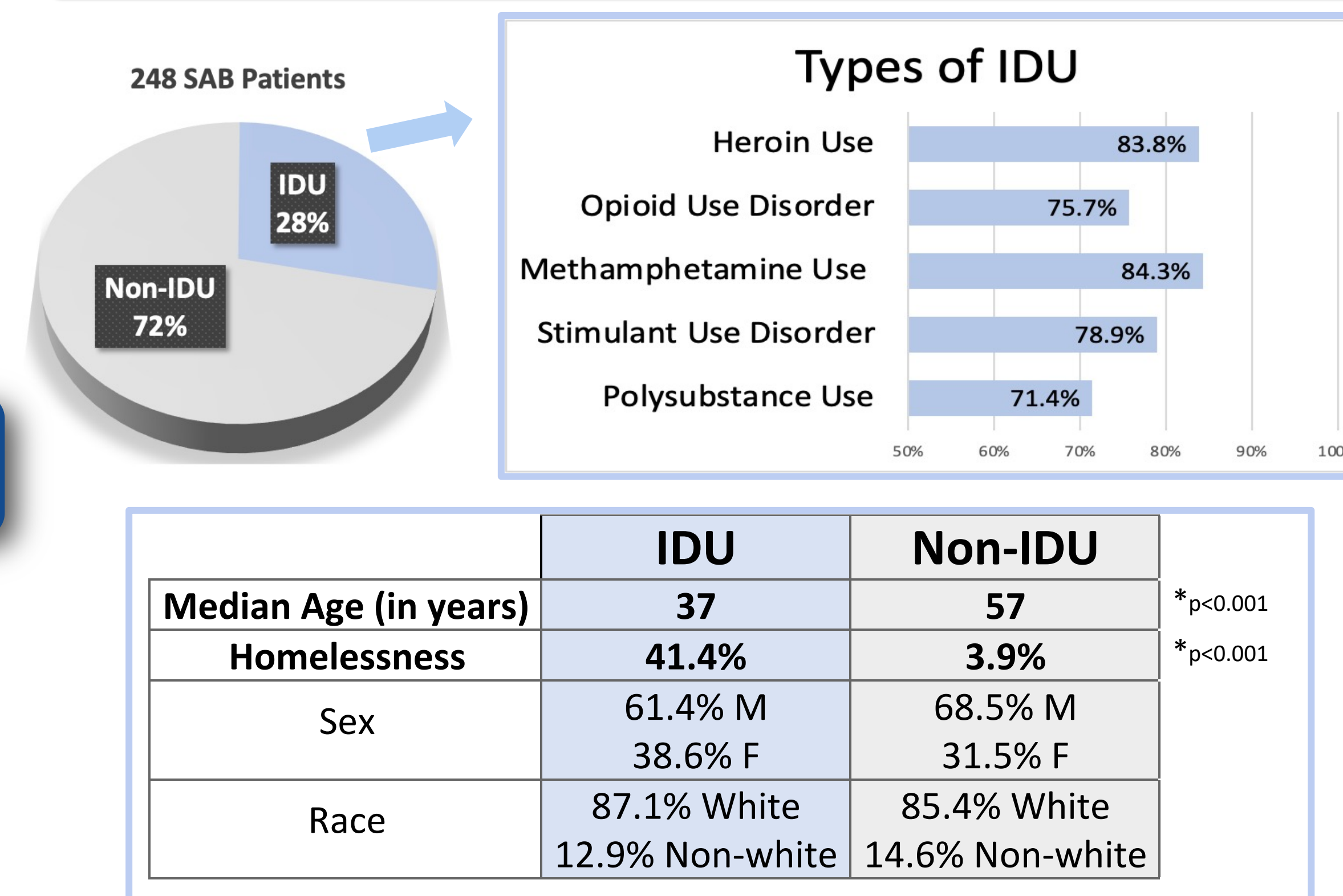
- Describe demographics and IV drug use (IDU) characteristics in patients with SAB at our institution.
- Compare differences in adherence to standard of care metrics and clinical outcomes in PWID.

## Methods

- **Design:** Single center retrospective cohort
- **Subjects:**
  - **Inclusion criteria (n=248):**
    - Adults (age  $\geq 18$  years) with  $\geq 1$  positive blood culture for *Staphylococcus aureus*
    - Admitted 1/1/2016-12/31/2017 to Oregon Health & Science University (OHSU)
  - **Exclusion criteria:**
    - Death, withdrawal of care, or transfer to another facility within 48 hours of first positive blood culture
    - Infection associated with a cardiac ventricular assist device
    - Missing 90-day mortality data
- **Procedure:** Electronic medical records were reviewed for patient characteristics, substance use, SAB characteristics, adherence to SAB quality of care metrics, and clinical outcomes
- **Statistical analysis:** Continuous data was analyzed using independent samples t-tests; categorical data was analyzed by the Pearson Chi-square or Fisher's exact test. All tests with  $P$  values  $<0.05$  were considered statistically significant.

## Results

### Patient Demographics

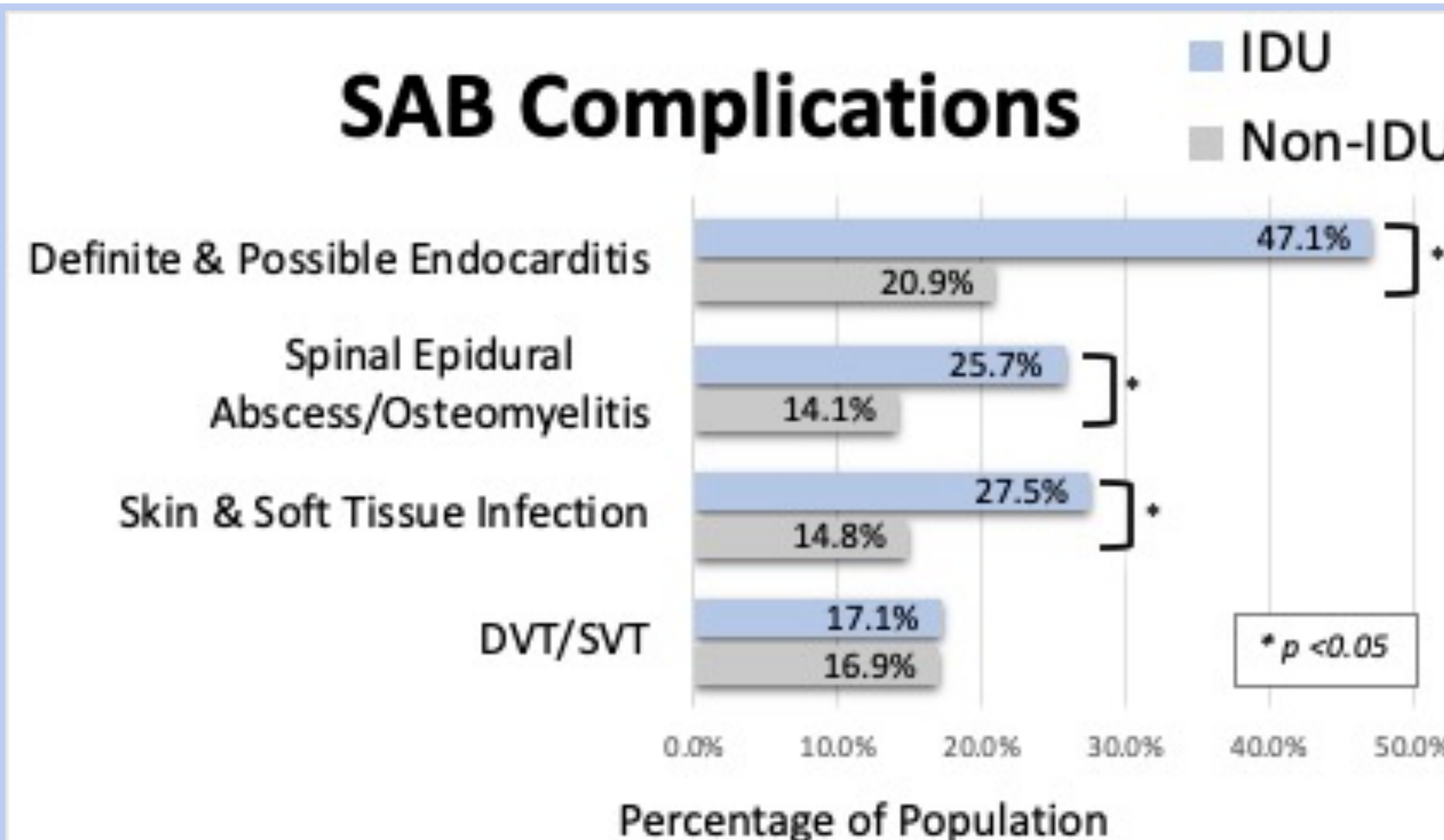


### Staphylococcus aureus Bacteremia Characteristics

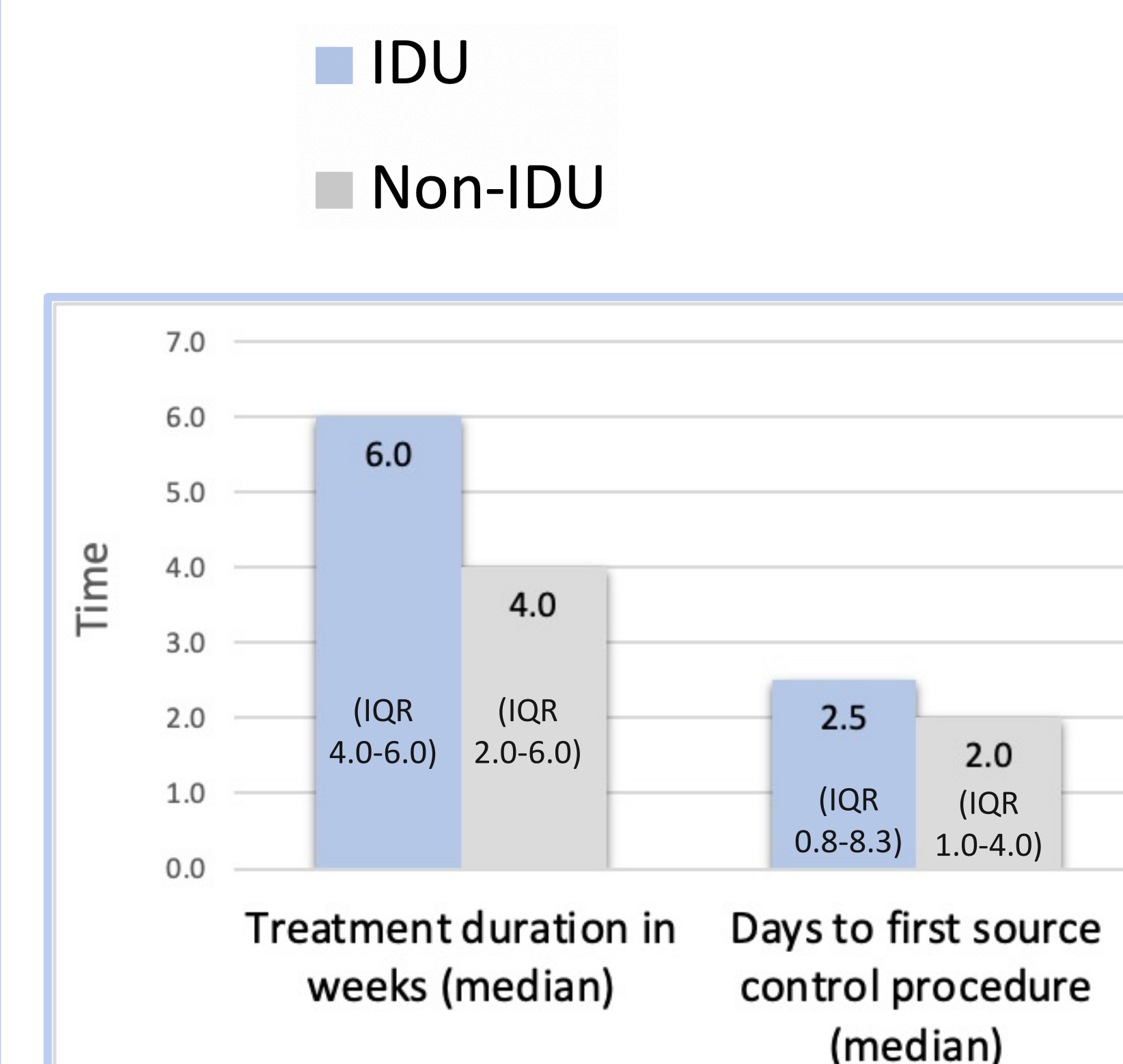
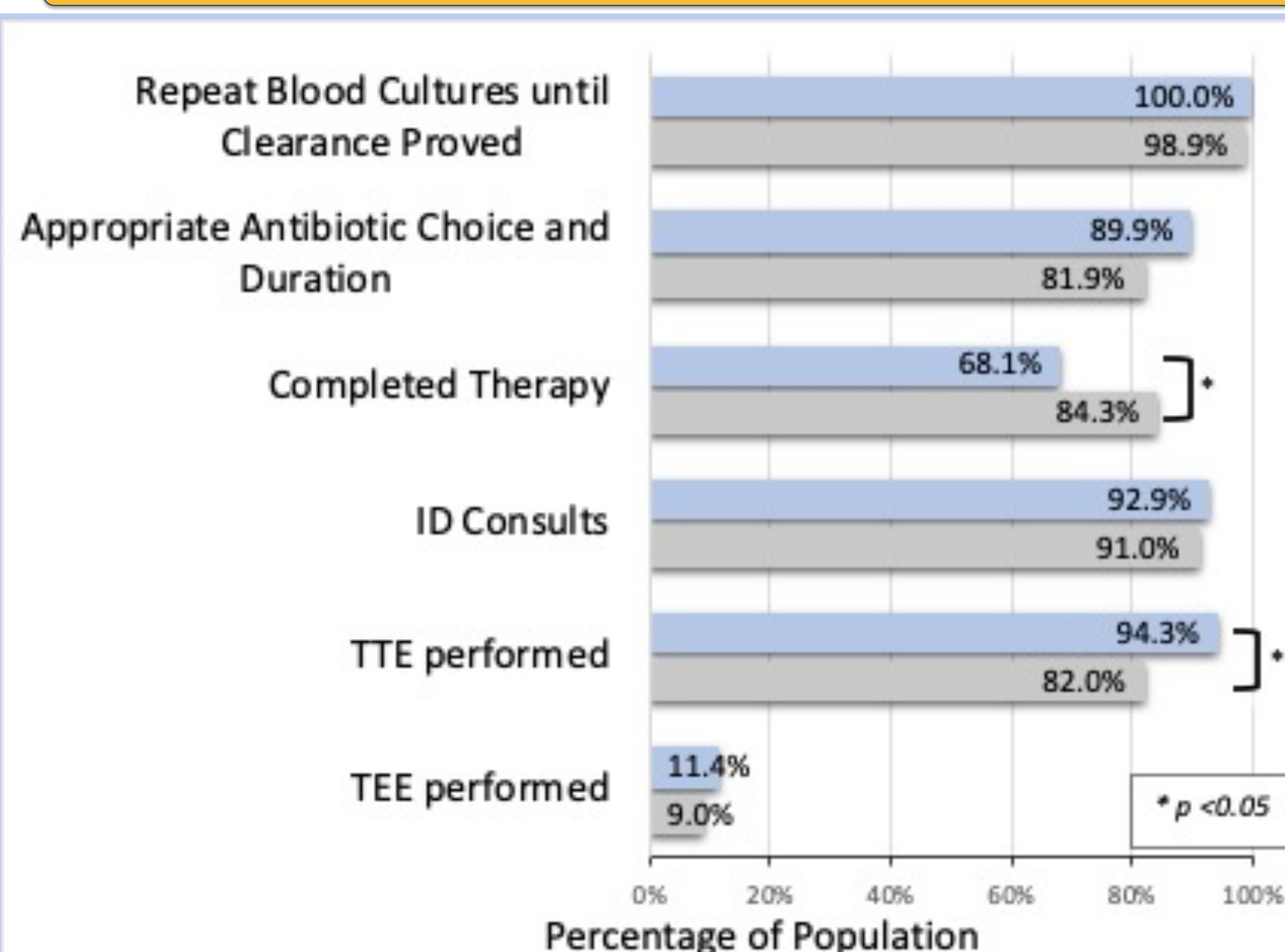
	IDU (n=70, 28.2%) N (%)	Non-IDU (n=178, 71.8%) N (%)	P-value
Duration of Bacteremia			
▪ Median (in days)	4.3 (IQR 2.4-7.5)	2.7 (IQR 1.7-4.9) <sup>a</sup>	0.001
Organism			
▪ MSSA	31 (44.3)	121 (68.0)	0.001
▪ MRSA	39 (55.7)	57 (32.0)	0.001
▪ Polymicrobial	7 (10.0)	20 (11.4) <sup>a</sup>	0.641

MSSA= Methicillin-sensitive *Staphylococcus aureus* / MRSA=Methicillin-resistant *Staphylococcus aureus*  
DVT= Deep vein thrombosis/ SVT= Superficial vein thrombosis  
Definite and possible endocarditis based on modified Duke criteria (excluding fever and injection drug use as minor criteria)  
<sup>a</sup> Two cases with unknown data.

### SAB Complications



### Adherence to SAB Standards of Care



## Results (cont.)

### SAB Outcomes

	IDU (n=70, 28.2%) N (%)	Non-IDU (n=178, 71.8%) N (%)	P-value
Length of stay in days (median)	21.5 (IQR 13.0-36.8)	14 (IQR 8.0-22.3)	0.001
Left AMA	18 (25.7)	2 (1.1)	<0.001
Inpatient mortality	3 (4.3)	17 (9.6)	0.17
90-day mortality	4 (5.7)	33 (18.6)	0.010
SAB recurrence within 90 days <sup>c</sup>	8/66 (12.1)	10/156 (6.4)	0.154
Readmitted within 90 days <sup>d</sup>	31/67 (46.3)	64/161 (39.8)	0.363

<sup>c</sup> Excluding patients who died during index hospitalization and cases with unknown 90-day recurrence data  
<sup>d</sup> Excluding patients who died during index hospitalization and cases with unknown 90-day readmission data

## Discussion

- **IDU was associated with:**
  - Younger age, hepatitis C, and homelessness
  - Higher rates of MRSA, endocarditis, spinal infections, and leaving AMA
  - Longer lengths of stay
- **Non-IDU was associated with:**
  - Diabetes, hemodialysis, and cancer
  - Higher 90-day mortality
- **No difference between groups in:**
  - Polymicrobial infections or DVT
  - Adherence to SAB Standards of Care (repeat blood cultures, antibiotic management, ID consultation)
  - 90-Day recurrence or readmission rates

## Conclusions

- There was no difference in adherence to SAB standards of care metrics between groups with and without IDU.
- Despite the PWID group being younger with fewer comorbidities, 90-day readmissions and recurrence were not different between the groups.
  - May represent influence of lower therapy completion, increased AMA discharges, and unmeasured social determinants of health.

## References

1. Serota DP, Niehaus ED, Schechter MC, et al. Disparity in Quality of Infectious Disease vs Addiction Care Among Patients With Injection Drug Use-Associated *Staphylococcus aureus* Bacteremia. *Open Forum Infect Dis.* 2019;6(7):ofz289. Published 2019 Jun 18. doi:10.1093/ofid/ofz289
1. Holland TL, Arnold C, Fowler VG Jr. Clinical management of *Staphylococcus aureus* bacteremia: a review. *JAMA.* 2014;312(13):1330-1341. doi:10.1001/jama.2014.9743