

# A Year of PHRM POCUS in Focus

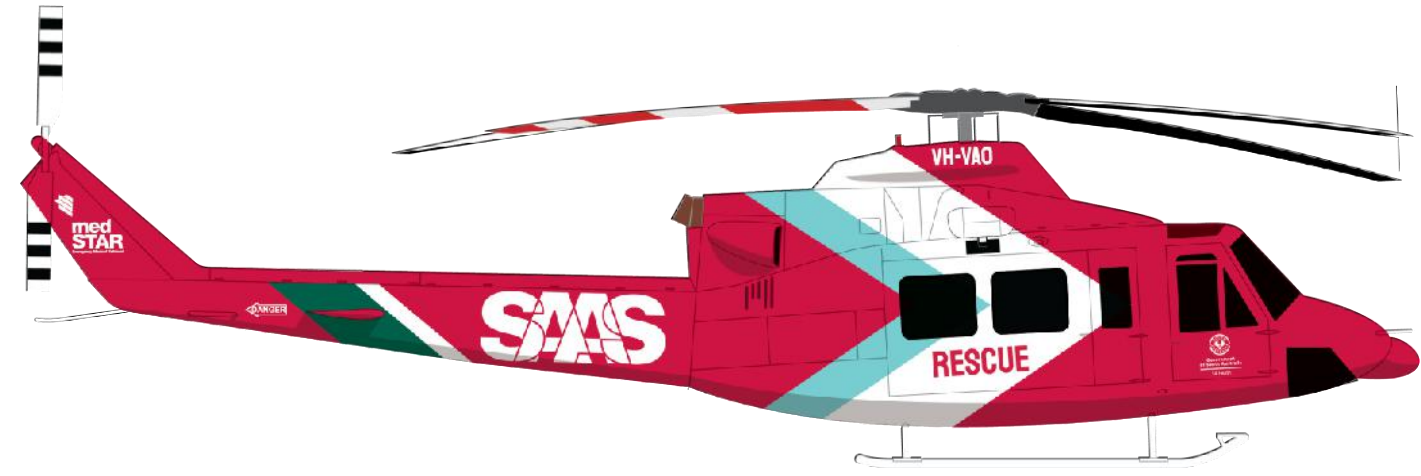
Andrew J Smith MEng MBChB FACEM <sup>1,2</sup>

1. Prehospital and Retrieval Fellow, SA Ambulance Service- MedSTAR, 2 Sir Reginald Ansett drive, Adelaide Airport 5950  
2. Staff Specialist- Lyell McEwin Hospital Emergency Department, Elizabeth Vale, SA, 5125



## Introduction

- Point of care ultrasound (POCUS) widely used in contemporary critical care, and is carried by many Helicopter Emergency Medical Systems (HEMS) teams<sup>1</sup>.
- MedSTAR is the South Australian pre-hospital and retrieval service containing the General Service (adults and pre-hospital) and MedSTAR Kids (paediatric and neonate).
- Portable ultrasound machines have been carried since its inception in 2009. We currently carry the SonoSite iViz (FUJIFILM Sonosite, Tokyo, Japan)
- There is limited literature about the scope of US use in physician-led pre-hospital and retrieval services.



## Aims

- Describe current use of POCUS in pre-hospital and inter-hospital (retrieval) missions.
- Identify factors associated with the use of ultrasound in these environments
- Identify if ultrasound use was associated with increased scene-time.
- Identify if quality of imaging from POCUS different between mission types

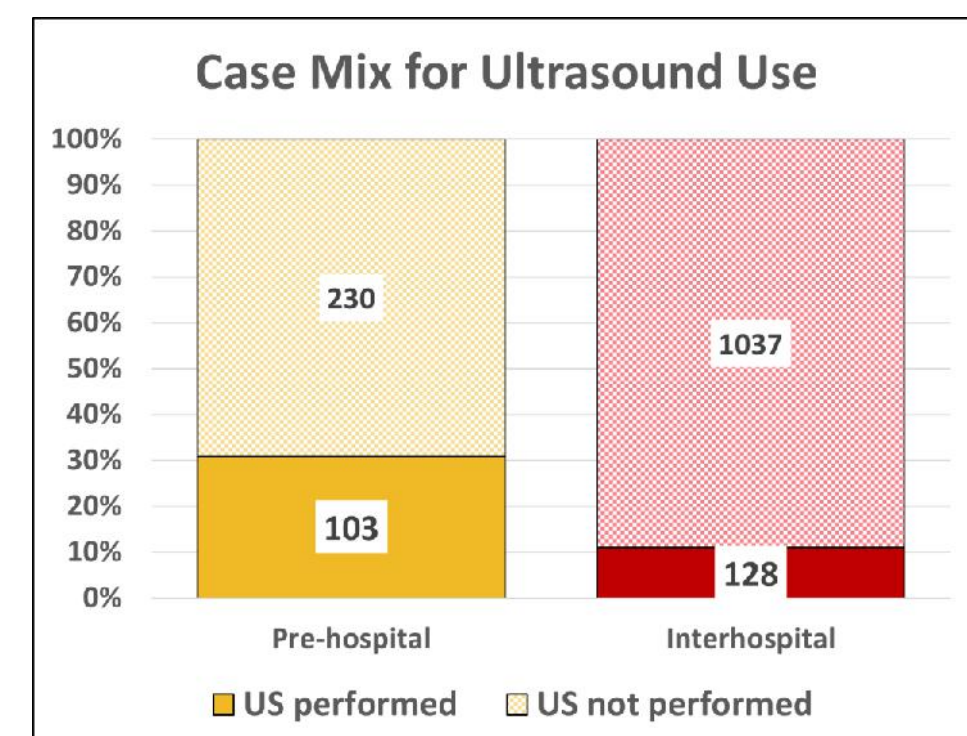
## Methods

- Retrospective review of all missions attended by the MedSTAR General Service, excluding stand-downs.
- Data from online database AirMaestro (Avinet, Adelaide, Australia) with case-note review performed for missing data.
- Independent samples T- test for continuous variables and  $\chi^2$  for categorical data, analysis in MS Excel.

## Results

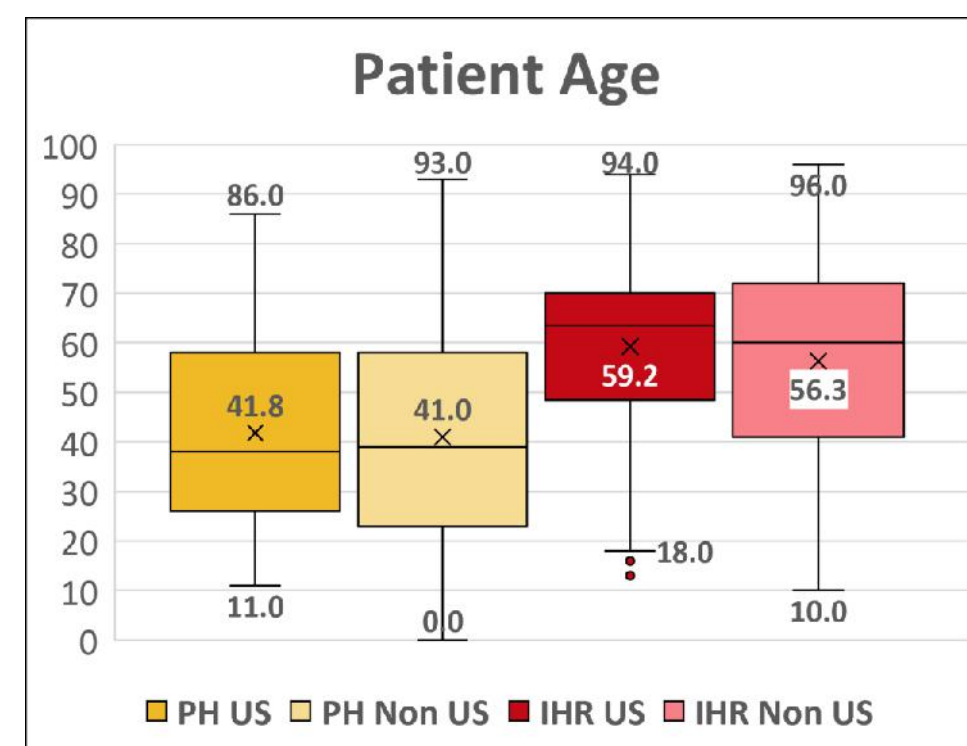
### Mission Profile and Demographics

Total 333 Pre-Hospital  
1165 Inter-Hospital missions.



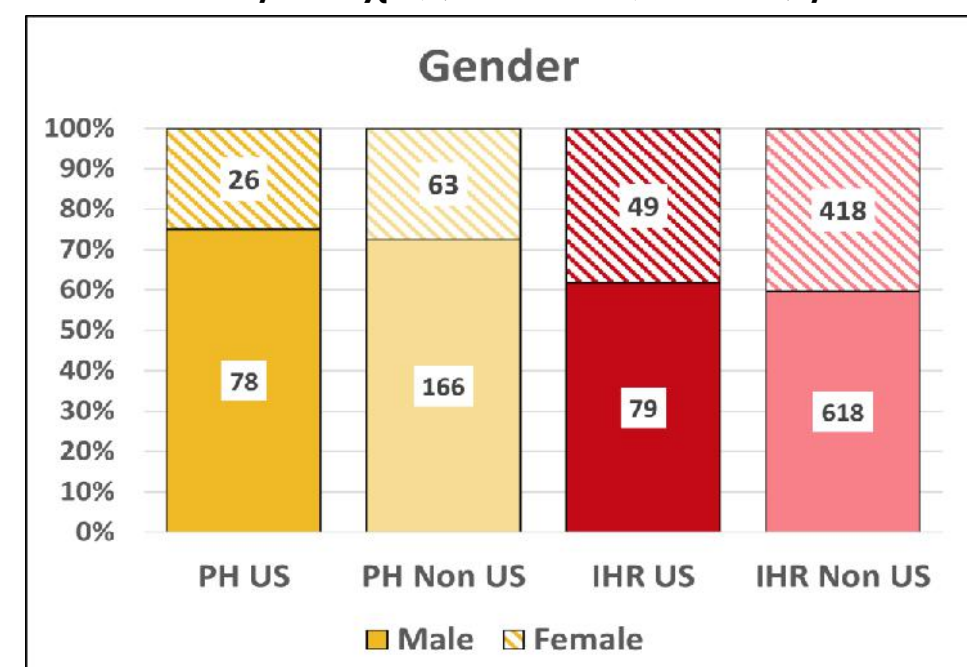
### Age not associated with POCUS

Pre-Hospital:  $t(323)=0.349, p=0.727$   
Inter-Hospital:  $t(1155)=1.725, p=0.085$



### Gender not associated with POCUS

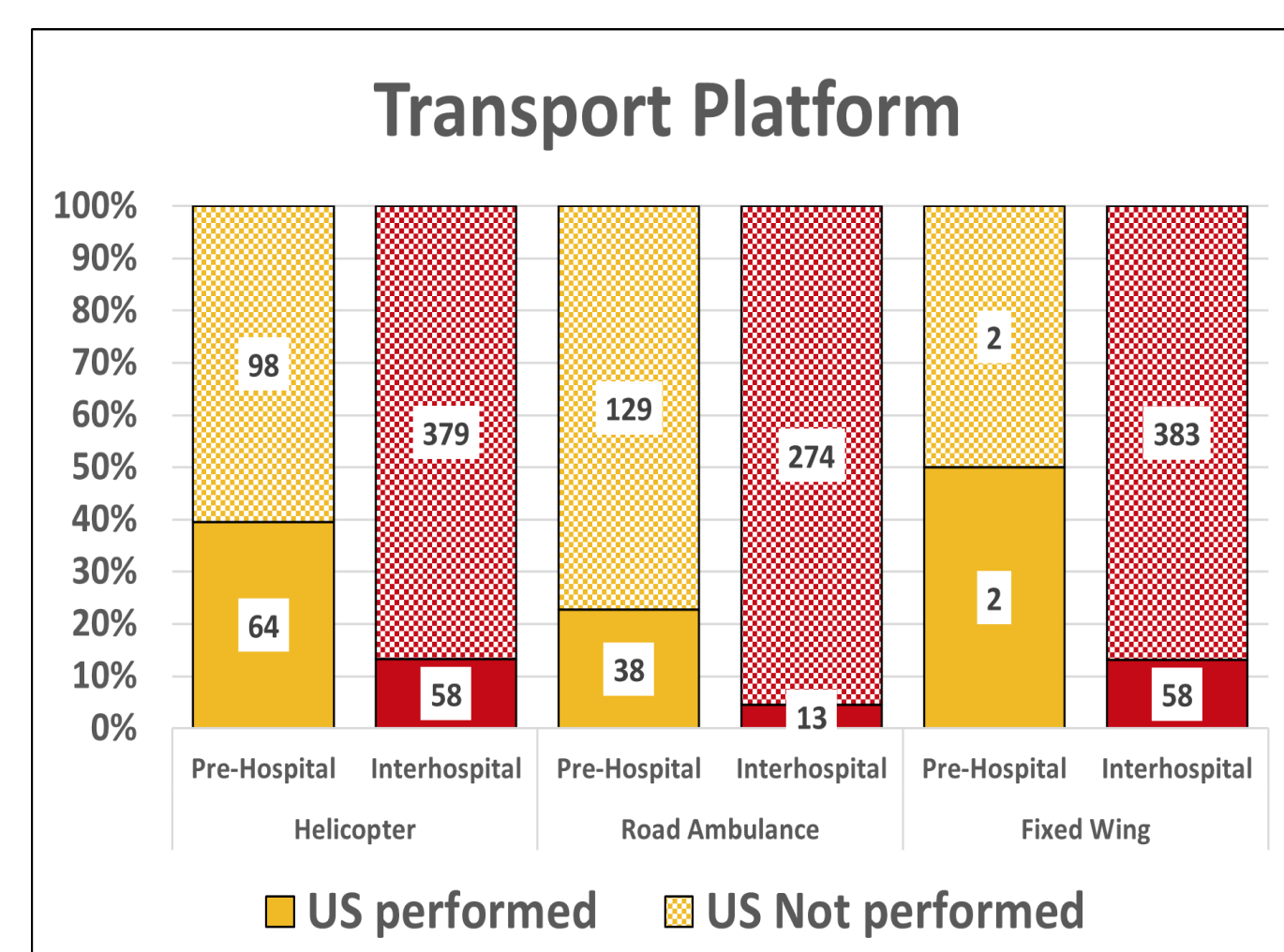
Pre-Hospital:  $\chi^2(1, N = 333) = 0.23, p = 0.63$   
Inter-Hospital:  $\chi^2(1, N = 1164) = 0.20, p = 0.65$



### Transport Platform

↑ POCUS rate if aviation asset for transport.

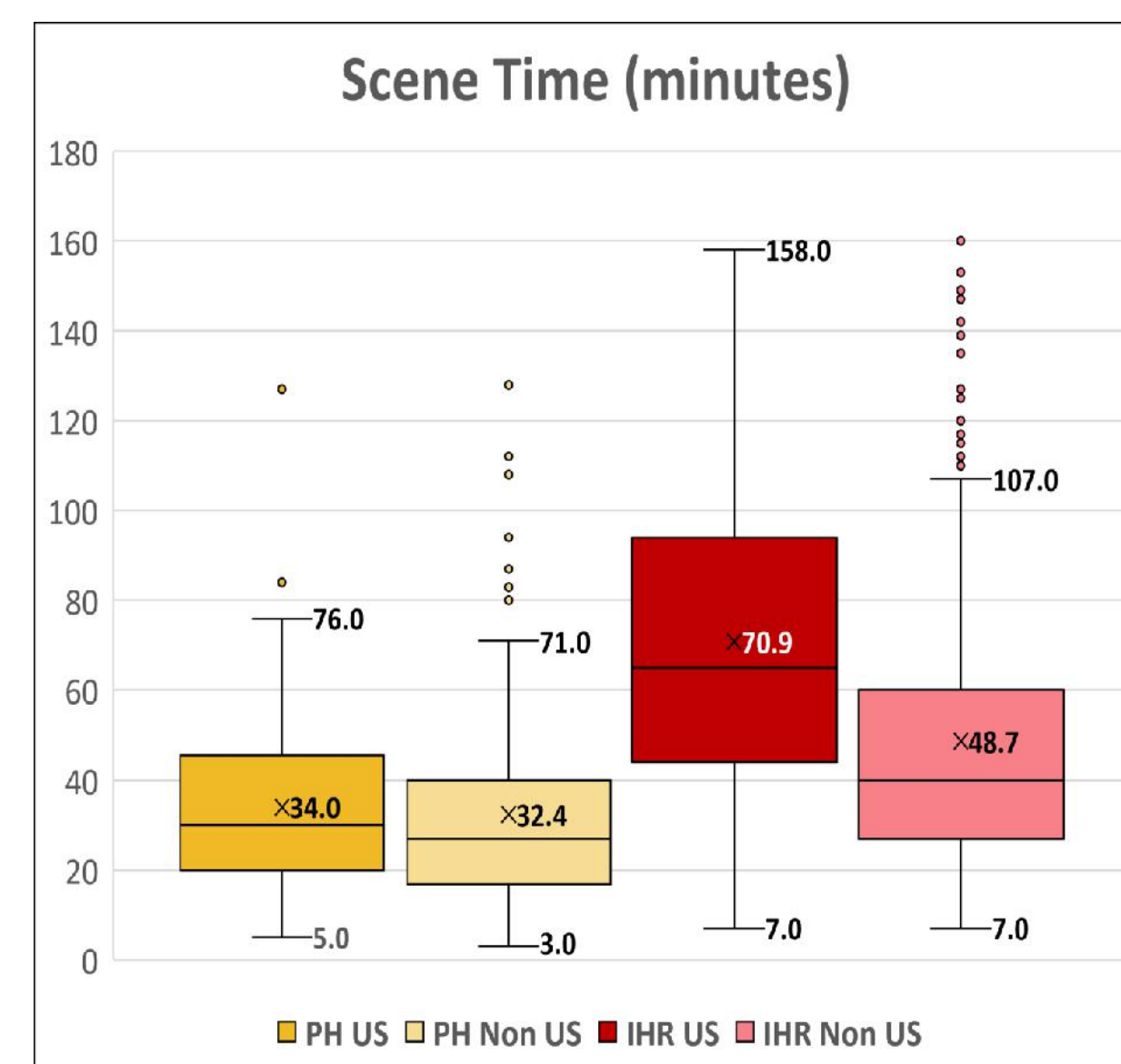
Pre-Hospital:  $\chi^2(2, N = 333) = 11.4, p = 0.003$   
Inter-Hospital  $\chi^2(2, N = 1165) = 16.6, p < 0.001$



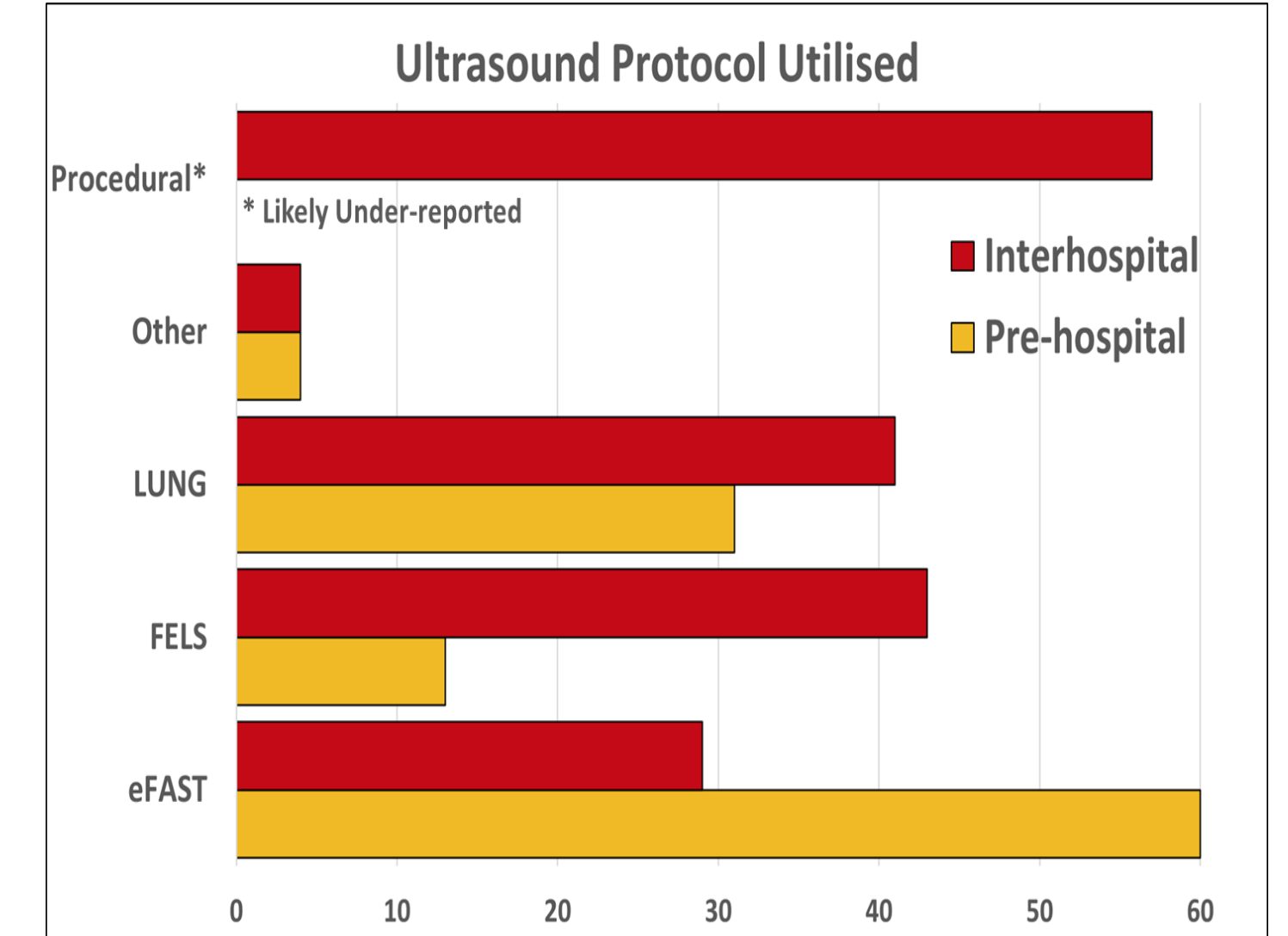
### Scene Time

Pre-Hospital: Not significantly different  
 $t(279)=0.696, p=0.487$

Inter-Hospital: ↑ when US performed  
 $t(1292)=6.336, p<0.01$



### Protocols Used



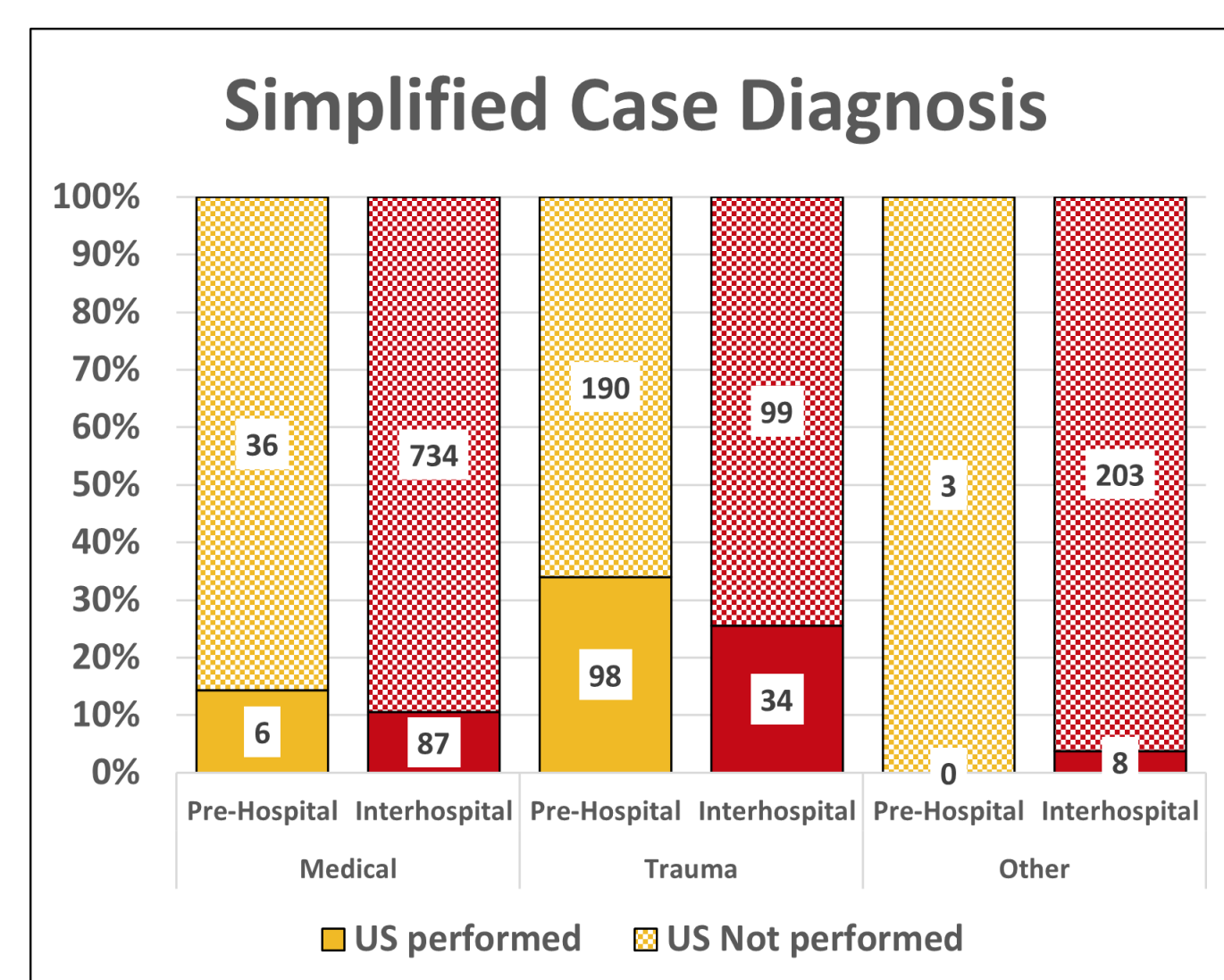
### Patient Simplified Diagnosis

Pre-Hospital: ↑ use if trauma

$\chi^2(2, N = 333) = 8.02, p = 0.018$

Inter-Hospital: ↑ use if trauma,

↓ use if "Other" (surgical, obstetric or mental health)  
 $\chi^2(4, N = 1165) = 42.39, p < 0.001$



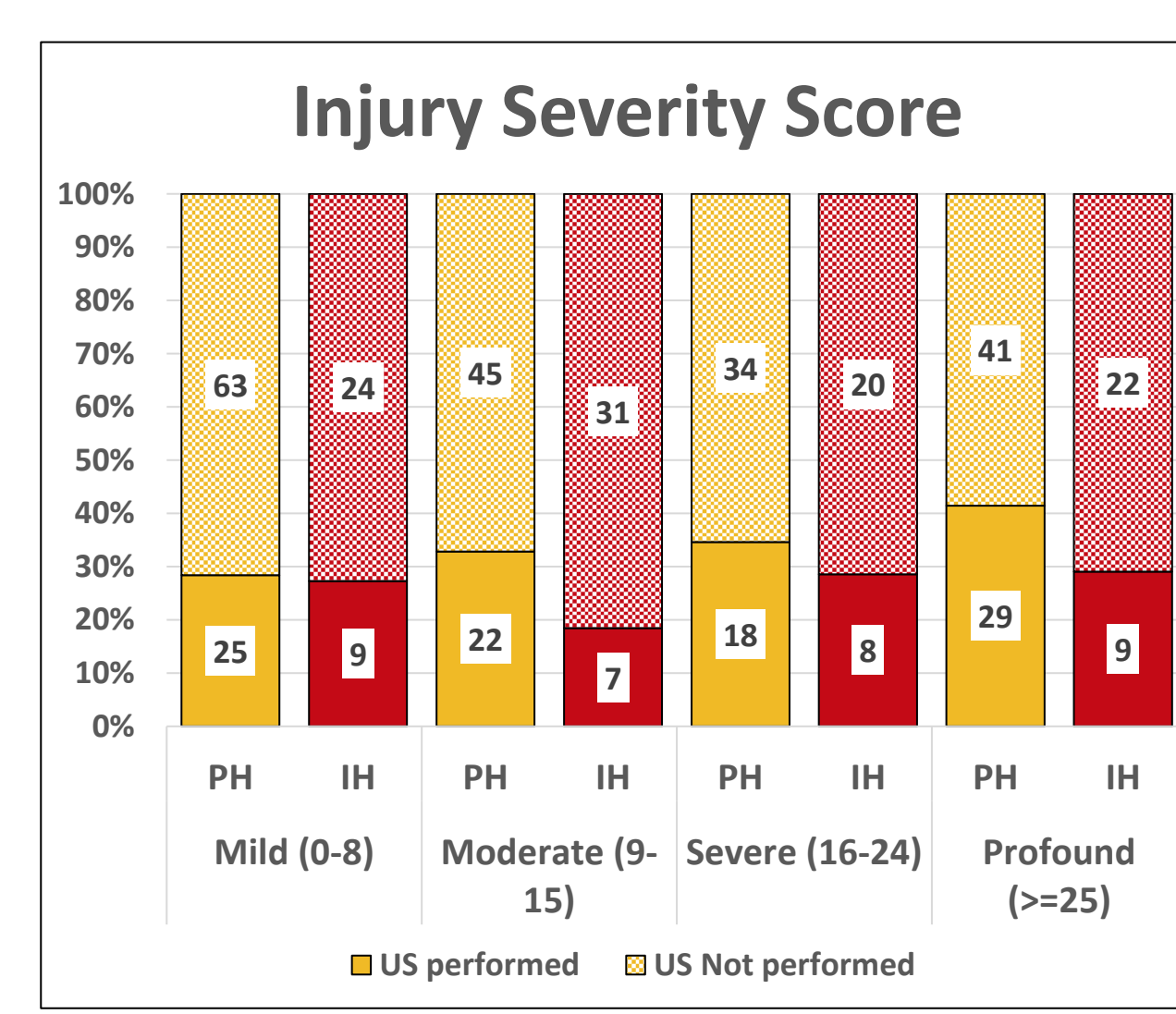
### Traumatic Injury Severity (ISS)

Pre-Hospital: No significant

association  $\chi^2(3, N = 277) = 3.00, p=0.39$

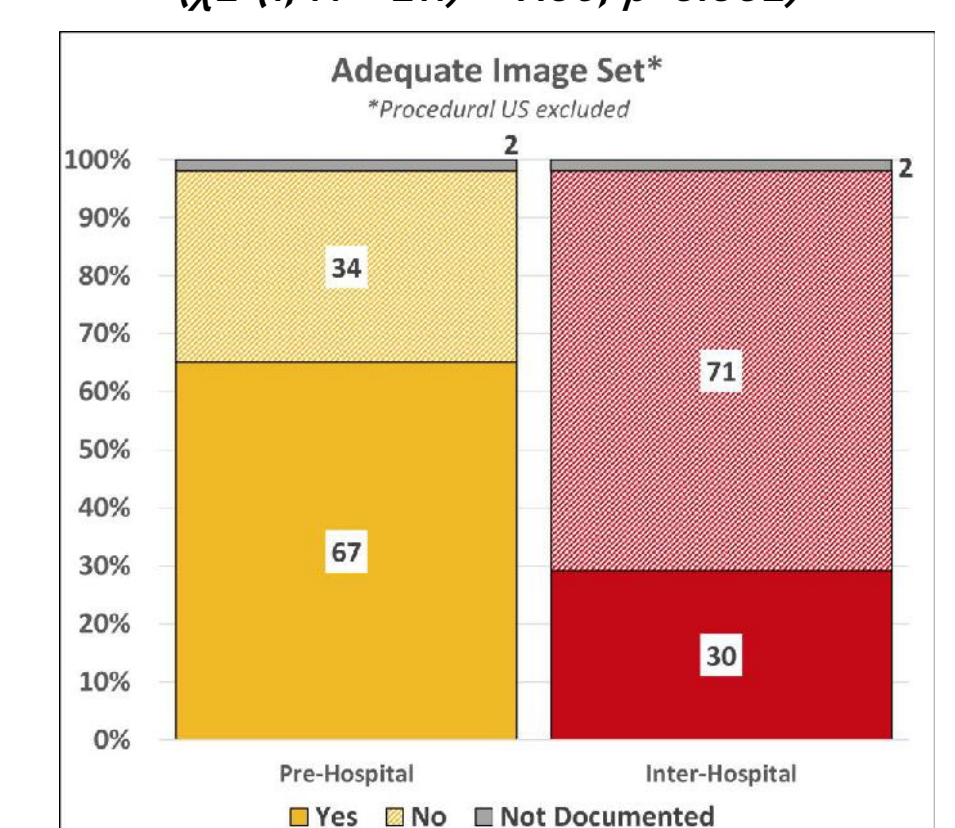
Inter-Hospital: No significant

association  $\chi^2(3, N = 130) = 5.27, p=0.15$



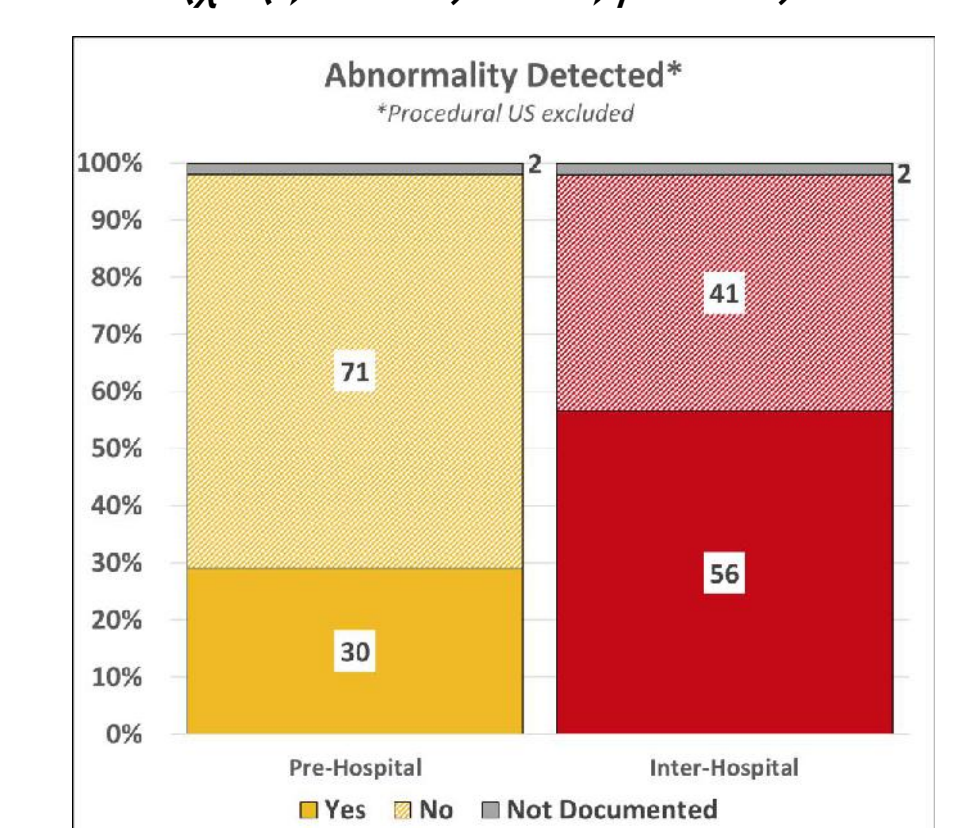
### Adequacy of Diagnostic POCUS

↑ Inter-hospital vs Pre-hospital  
 $\chi^2(1, N = 211) = 9.35, p=0.002$



### Abnormality Detected

↑ Inter-hospital vs Pre-hospital  
 $\chi^2(1, N = 211) = 7.13, p=0.007$



## Discussion

- These data reflect that POCUS is used more frequently when far from base (i.e. using aviation assets).
- Inter-hospital scene time when POCUS used likely reflects an increased procedural and diagnostic burden on the retrieval team.
- Minimal impact on pre-hospital scene time is similar to other studies<sup>2</sup>
- Self-entered data and retrospective review make assessment of adequacy and abnormality challenging to confirm



## Conclusions

- Use of POCUS is NOT associated with prolonged scene time in pre-hospital missions.
- The severity of trauma is not associated with a change in the likelihood of POCUS use.
- POCUS can be embedded within a skilled system to provide both diagnostic and procedural assistance, particularly in remote areas.
- Further work is required to confirm adequacy of data sets and abnormalities described.



## References

- Hilbert-Carius, P., Struck, M.F., Rudolph, M. et al. Point-of-care ultrasound (POCUS) practices in the helicopter emergency medical services in Europe: results of an online survey. *Scand J Trauma Resusc Emerg Med* 29, 124 (2021). <https://doi.org/10.1186/s13049-021-00933-y>
- Scharonow, M., Weilbach, C. Prehospital point-of-care emergency ultrasound: a cohort study. *Scand J Trauma Resusc Emerg Med* 26, 49 (2018). <https://doi.org/10.1186/s13049-018-0519-9>