

# TARN survival outcomes for patients attended by East Anglian Air Ambulance critical care teams, 2013-2019

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## Introduction

The Trauma Audit and Research Network (TARN) monitors care of trauma patients within hospitals in England, including benchmarking of survival scores by centre. TARN does not routinely measure the impact of pre-hospital providers, despite evidence that the standard of pre-hospital care can have an important impact on patient outcomes. This retrospective service evaluation study computes TARN survival scores for patients attended by East Anglian Air Ambulance (EAAA).

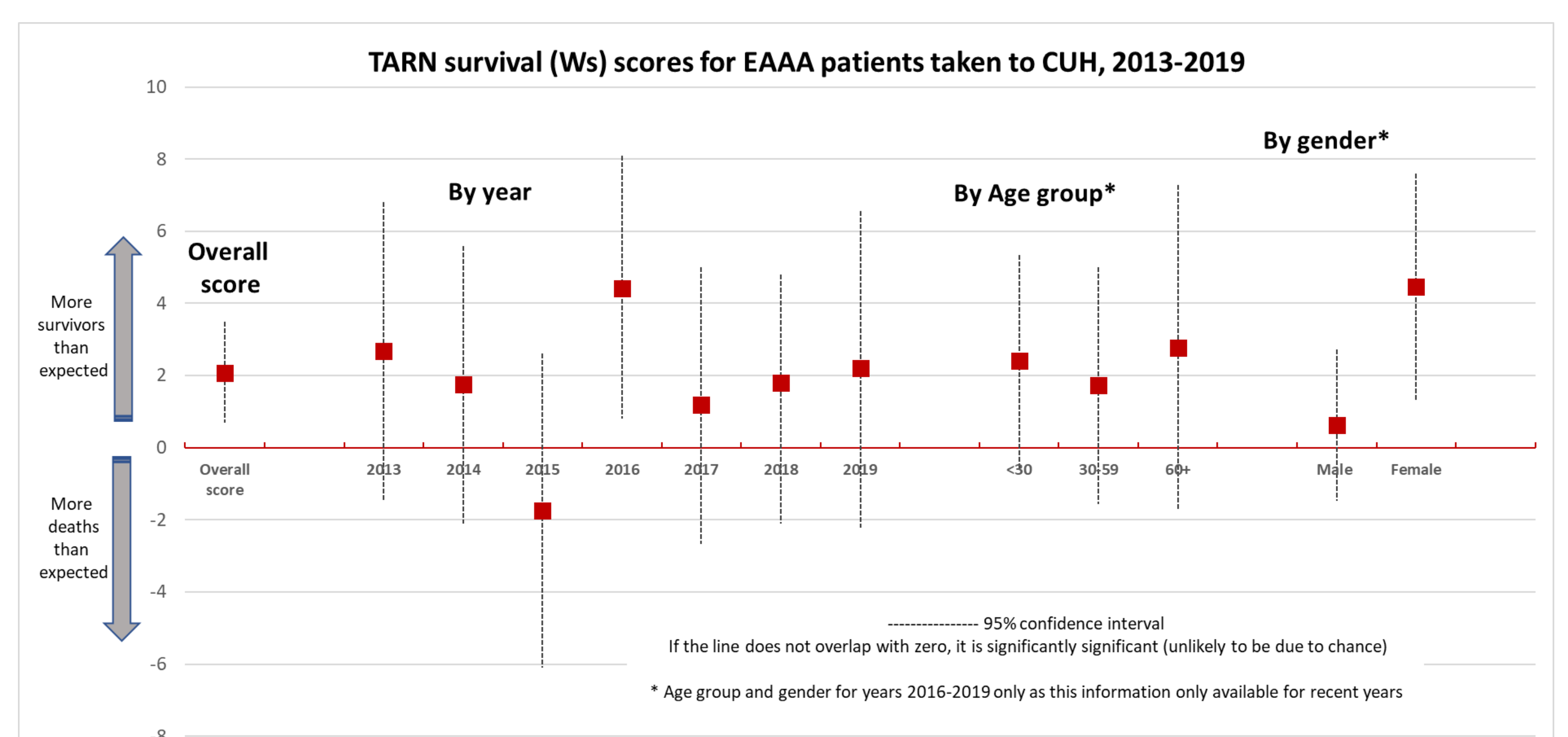
## Methods

Data were obtained from the East of England trauma network for patients on the TARN register who received pre-hospital treatment from EAAA between 2013 and 2019 and were admitted to Cambridge University Hospitals (CUH) NHS Trust. The data included each patient's survival probability percentage computed by TARN based on the initial severity of their injuries and other factors, such as age and general health.

The survival probability was compared with the 30-day outcome for the patients (alive or dead) and used to compute crude survival scores (W) and casemix-adjusted summary survival scores (Ws) for the cohort using the TARN statistical methodology (1). Scores were also computed for sub-groups of year, age group, gender and survival probability.

All data were anonymised. This was a service evaluation study with TARN data obtained via a data sharing agreement with the trauma network.

Figure 2: Adjusted rates of survival (Ws), 2013-2019



## Results

Between 2013 and 2019, 882 TARN patients were identified as having been treated by EAAA and admitted to CUH. This is equivalent to around 10% of all CUH TARN patients and around half of trauma patients treated by EAAA and taken to CUH.

The crude survival score for the cohort was 3.96 per 100 patients. Figure 1 shows the W scores by survival probability group. Across all survival probability groups, the W score is greater than zero, indicating more survivors than expected. The data also shows an increasing rate of survivors for more severely injured patients, possibly indicating that EAAA are providing the most benefit for the most seriously injured.

The casemix-adjusted survival score (Ws) was 2.08 per 100 patients, with a 95% confidence interval 0.68 to 3.49. Figure 2 shows the overall score, scores per year, by age group and by gender.

Figure 1: Crude rate of survival (W) by probability of survival, 2013-2019

Survival Band %	Number of Patients	Expected Survivors	Actual Survivors	Rate of Survival (per 100)
95-100	440	434	437	0.74
90-95	86	80	82	2.48
80-90	81	69	73	5.05
65-80	68	49	54	7.02
45-65	90	50	57	7.95
25-45	63	22	27	8.11
0-25	54	8	16	15.63
<b>Total</b>	<b>882</b>	<b>711</b>	<b>746</b>	<b>3.96</b>

## Conclusion

- Between 2013 and 2019, EAAA patients who were admitted to CUH and included on the TARN register had a rate of survival which was significantly higher than expected
- These findings are in line with previous work in the North East(2) and Scotland (3) which found a survival benefit for trauma patients attended by critical care teams
- This analysis demonstrates the value of pre-hospital providers having access to TARN outcomes data for their patients

### References

- (1) TARN. Explanation of Tarn probability of survival model. <https://www.tarn.ac.uk/Content.aspx?ca=4&c=3515>
- (2) Smith CA, Hardern RD, LeClerc S, Howes RJ. Prehospital analysis of northern trauma outcome measures: the PHANTOM study. *Emergency Medicine Journal*. 2019 Apr 1;36(4):213-8.
- (3) Maddock A, Corfield AR, Donald MJ, Lyon RM, Sinclair N, Fitzpatrick D, Carr D, Hearn S. Prehospital critical care is associated with increased survival in adult trauma patients in Scotland. *Emergency medicine journal*. 2020 Mar 1;37(3):141-5.



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