

# Is intravenous thrombolysis getting any faster in the UK?

## Data from the National Stroke Registry

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### Introduction

The Sentinel Stroke National Audit Programme (SSNAP) is the national stroke registry for England, Wales and Northern Ireland. Intravenous thrombolysis (IVT) is an effective treatment for acute ischaemic stroke and increases the likelihood of a good outcome. IVT is recommended within 4.5 hours of symptom onset, but the benefit of IVT is time-dependent (Emberson et al., 2014) and prompt administration is critical. Continuous monitoring and improvement in door-to-needle (DTN) times is essential to increase the rate of good outcomes and maintain a high standard of care. We investigated whether there have been improvements in DTN times in the UK during the last five years.

### Methods

Patient-level data were extracted from the SSNAP database. Patients admitted to stroke units in England, Wales and Northern Ireland who received IVT between July 2013 and September 2018 were included in the analysis. The study period was divided into quarters and trends in median DTN times and the proportion of patients receiving IVT within one hour of hospital arrival were examined.

### Results

Of 379,022 ischaemic strokes admitted to stroke units during the study period, 13% (95%CI 12.9% to 13.1%) received IVT.

Significant reductions in DTN times were observed. Overall median DTN time decreased from 59 minutes (IQR, 40 to 88) in 2013 to 51 (35 to 75) in 2018 ( $p$  for trend  $<0.001$ ). A linear trend in the overall decrease in median DTN time was observed, although the pattern differed by country, with Northern Ireland and Wales showing non-linear trends. An estimated Somers' asymmetric delta of  $-0.044$  (95%CI  $-0.039$  to  $-0.049$ ) confirmed a significant, albeit weak trend towards shorter DTN times in each succeeding year (Figure 1).

The proportion of patients receiving IVT within 1 hour of arrival increased significantly from 52% (50% to 55%) in 2013 to 63% (62% to 65%) in 2018 ( $p$  for trend  $<0.001$ ; Figure 2).

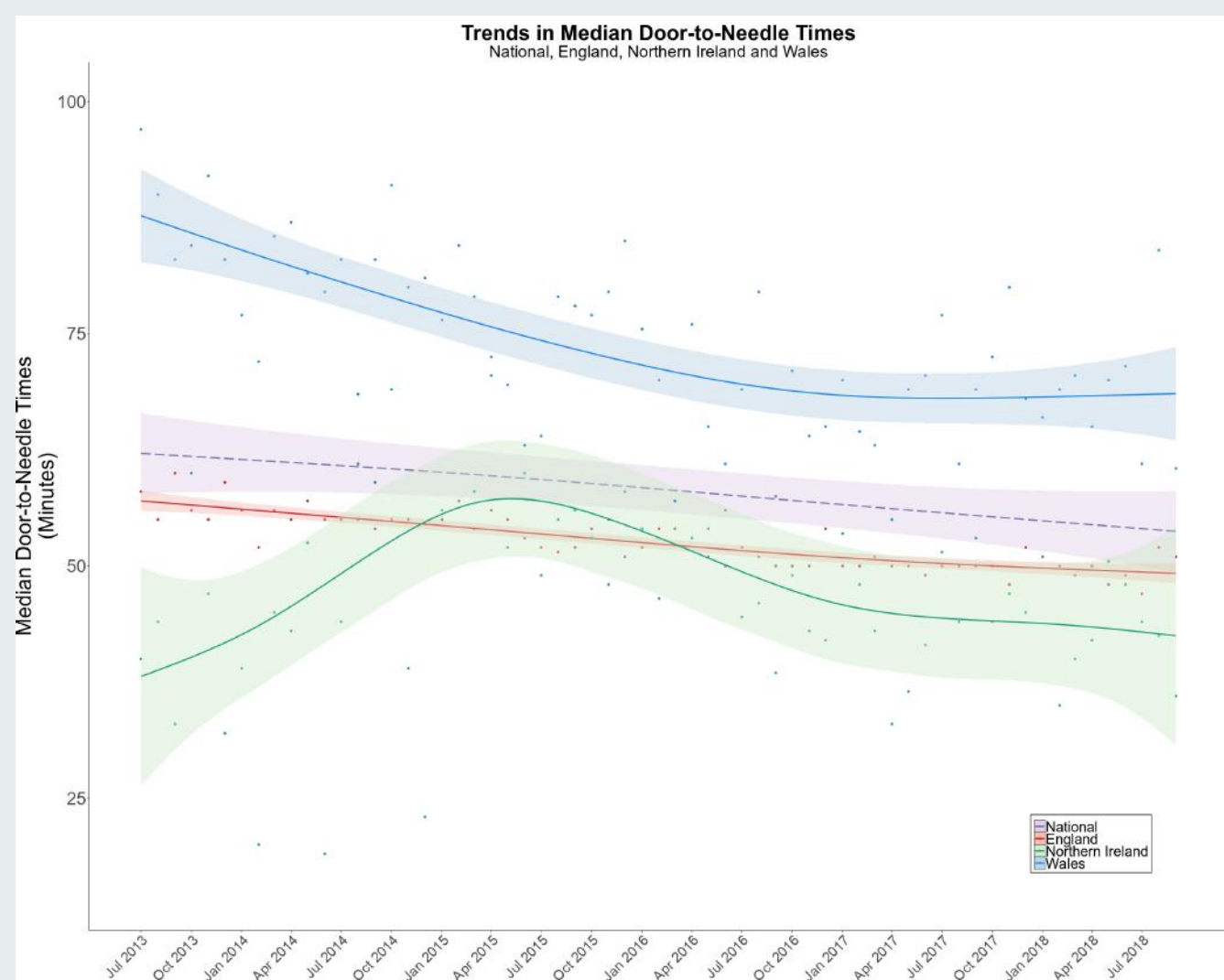
### Conclusions

There has been a small but significant reduction in median DTN time in the UK over the last 5 years to a current value of 51 mins. The proportion of patients thrombolysed within 1 hour has significantly increased.

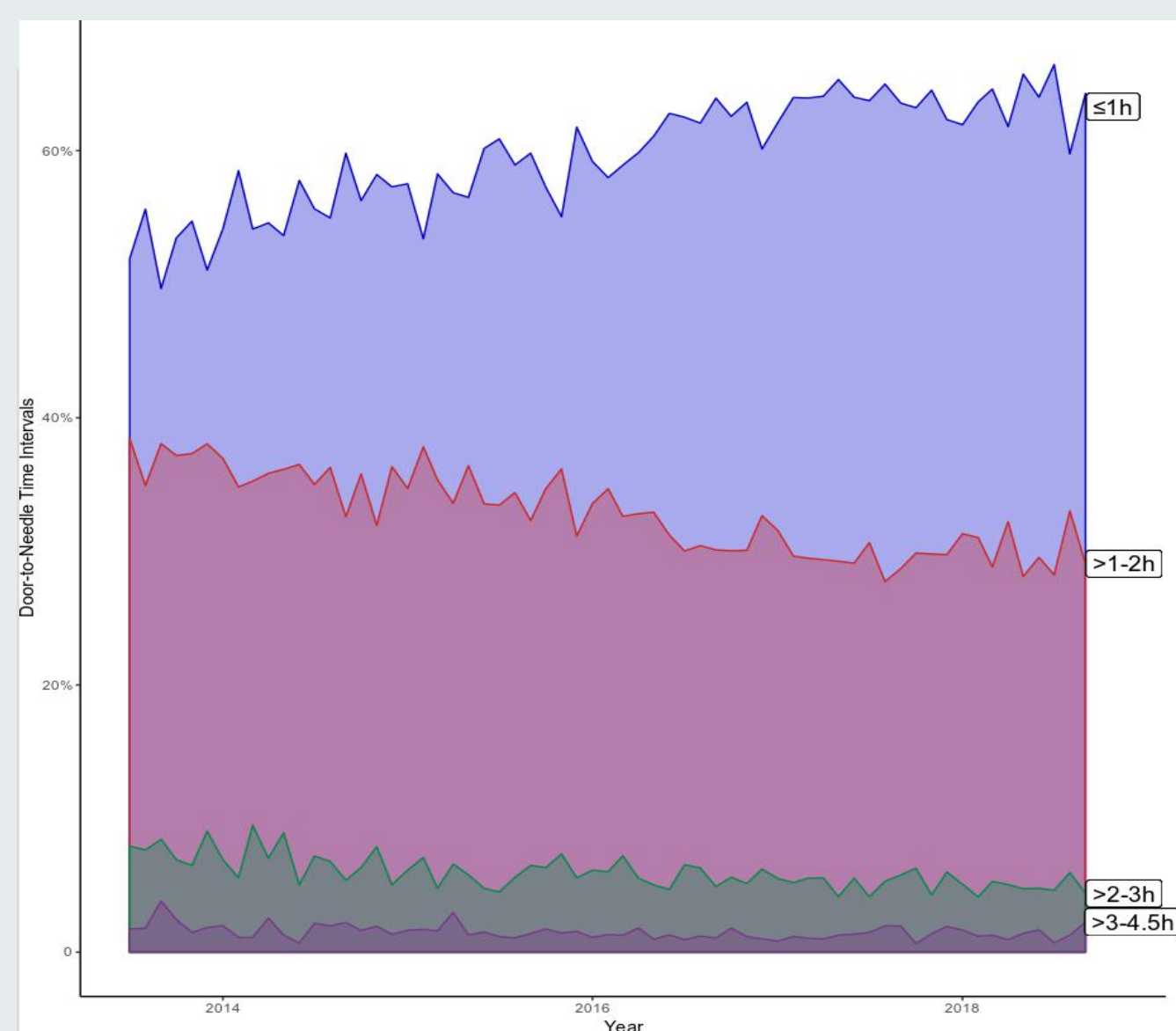
However, this effect seems to be primarily confined to England, while the rate of decline in DTN time in Wales and Northern Ireland has slowed in recent years. Furthermore, significant variability exists in DTN times in these two countries. Further strategies to reduce DTN times and maximise the population benefits of IVT are needed.

### Acknowledgements

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**Figure 1.** Trends in median DTN times across the study period. Generalised Additive Models were fitted to identify linear and nonlinear patterns in the data. The purple dashed line denotes the overall trend.



**Figure 2.** Change in proportions over time in DTN intervals, with a noticeable trend towards shorter DTN times.  $P$  for trend  $<0.001$