Statistical Note: Ambulance Quality Indicators (AQI)

The latest Systems Indicators for May 2019 for Ambulance Services in England showed that three of the six response standards in the Handbook[1] to the NHS constitution were met.

1. Systems Indicators

Besides the May 2019 Systems Indicators, North East Ambulance Service (NEAS) have supplied the April 2019 data that were missing from last month's publication.

1.1 Response times

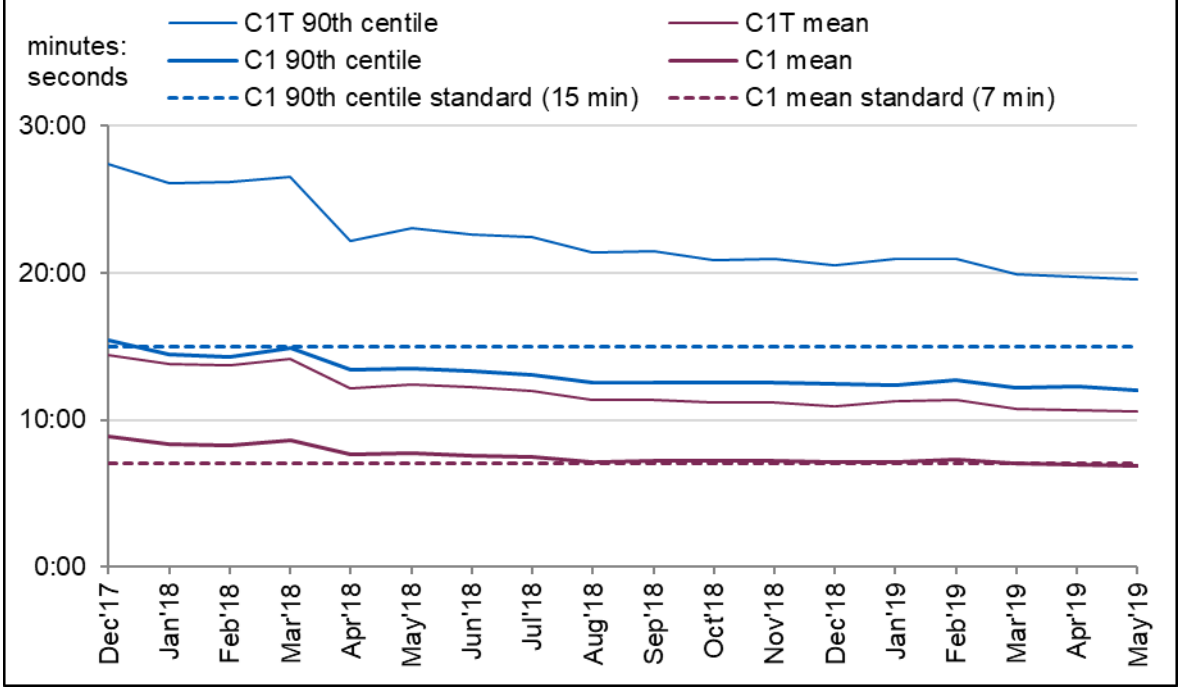
In May 2019, for England, the mean and 90th centile response times for all categories improved on April 2019. The C1 mean, C1 90th centile, and C4 90th centile standards were all met.

The mean average C1 response time across England was 6 minutes 54 seconds in May 2019, meeting the standard of 7 minutes, and the shortest time since the current categories were adopted throughout England in 2017.

The C1 90th centile response times averaged 12:03 across England in May 2019, shorter than the standard of 15 minutes, also the shortest time in the series.

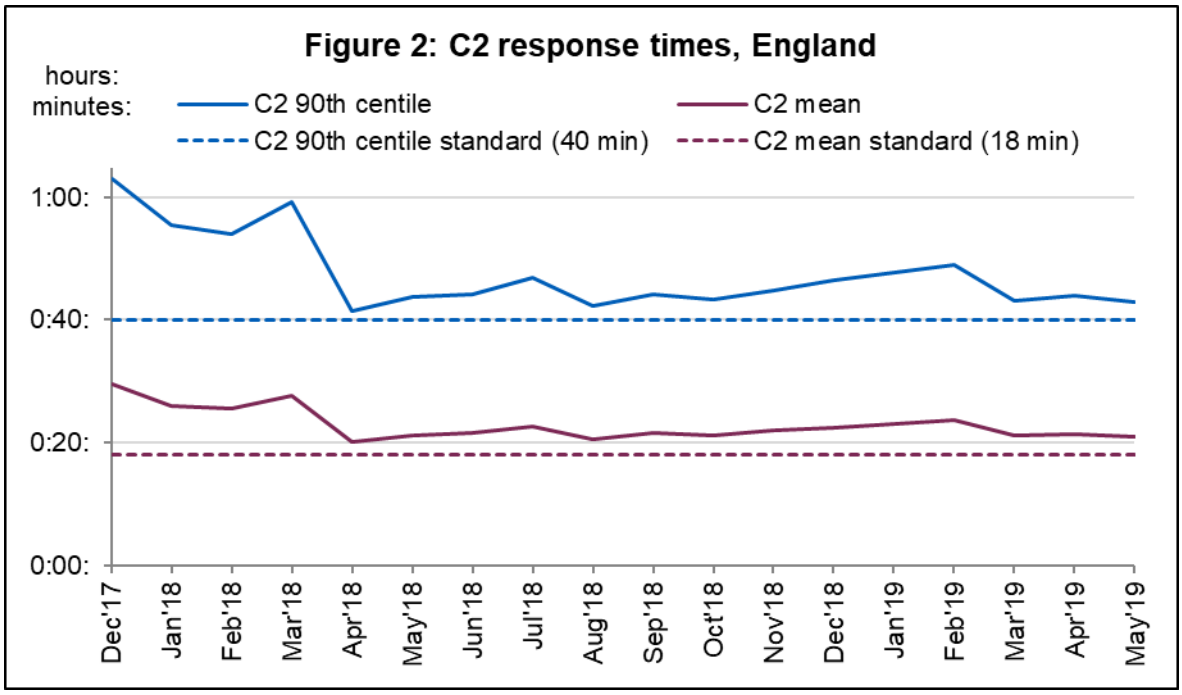
For C1T (arrival of transporting vehicle, for C1 patients transported) the mean and 90th centile response times were 10:32 and 19:31 respectively, again the shortest times in the series.

Figure 1: C1 & C1T response times, England



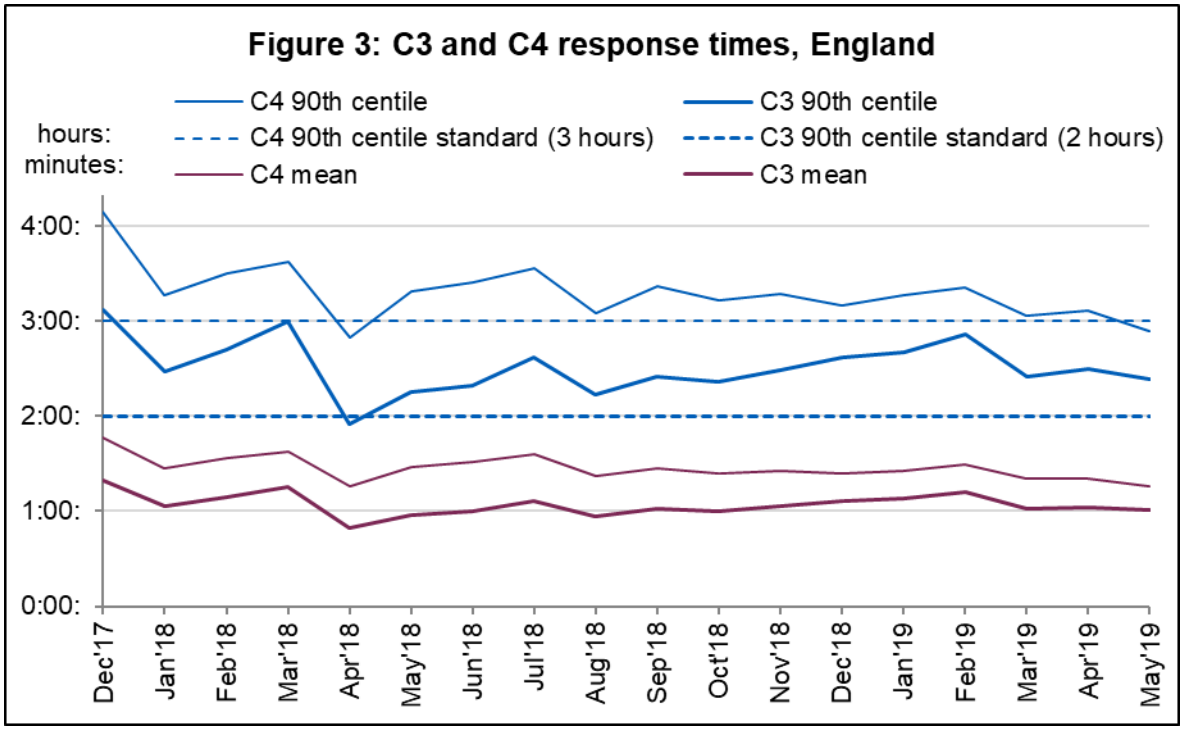
[1] Ambulance standards are in the Handbook to the NHS Constitution: www.gov.uk/government/publications/supplements-to-the-nhs-constitution-for-england

Figure 2 shows the C2 mean average response time for England was 21:01 in May 2019, longer than the standard of 18 minutes. The C2 90th centiles averaged 42:57 across England, also longer than the standard of 40 minutes.



For England in May 2019, the C3 mean average response time was 1:00:29. The C3 90th centile times averaged 2:23:27, longer than the standard of 2 hours.

The C4 mean average response time was 1:16:02 for England in May 2019. The C4 90th centile times averaged 2:53:34, meeting the standard of 3 hours for the first time since April 2018.



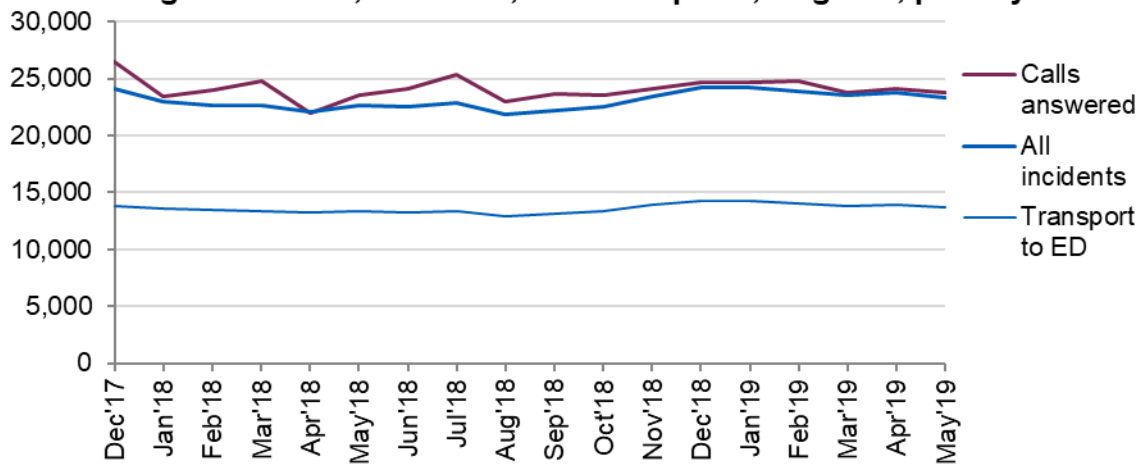
1.2 Other Systems Indicators

The mean average call answer time across England in May 2019 was 5 seconds, as it was in April and March 2019. The 90th centile call answer times averaged 7 seconds in May 2019, which is the second month in which we have collected this data item.

Per day, there were (Figure 4):

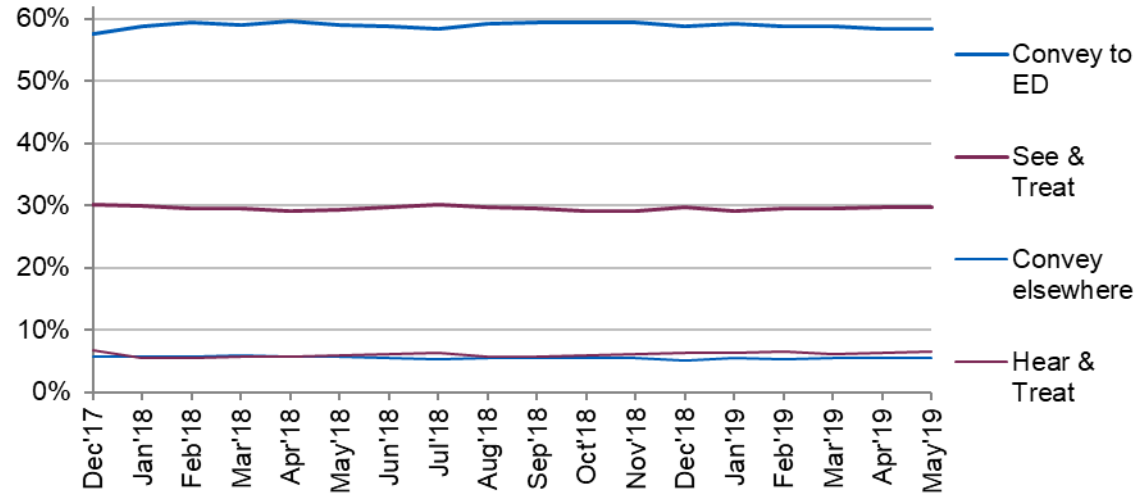
- 23.7 thousand calls to 999 answered in May 2019, a 1.6% decrease on April;
- 23.4 thousand incidents that received a response from an Ambulance Service in May, a 1.6% decrease on April;
- 13.7 thousand incidents where a patient was transported to an Emergency Department (ED) in May, a 1.7% decrease on April.

Figure 4: Calls, incidents, and transports, England, per day



The proportion of incidents where a patient was transported to ED was 58.4% in May 2019. Other incidents (Figure 5) comprised 5.4% with a patient transported elsewhere, 29.6% where patients were attended but not transported (see and treat), and 6.5% resolved on the telephone (hear and treat). In May, these percentages were all within 0.2 percentage points of their April equivalents.

Figure 5: Hear, See, Treat, Convey



2. Clinical Outcomes

We continue to publish Clinical Outcomes data in spreadsheets each month; and (for England as a whole) discuss data for each topic area in the month when we publish new bundle data for that topic.

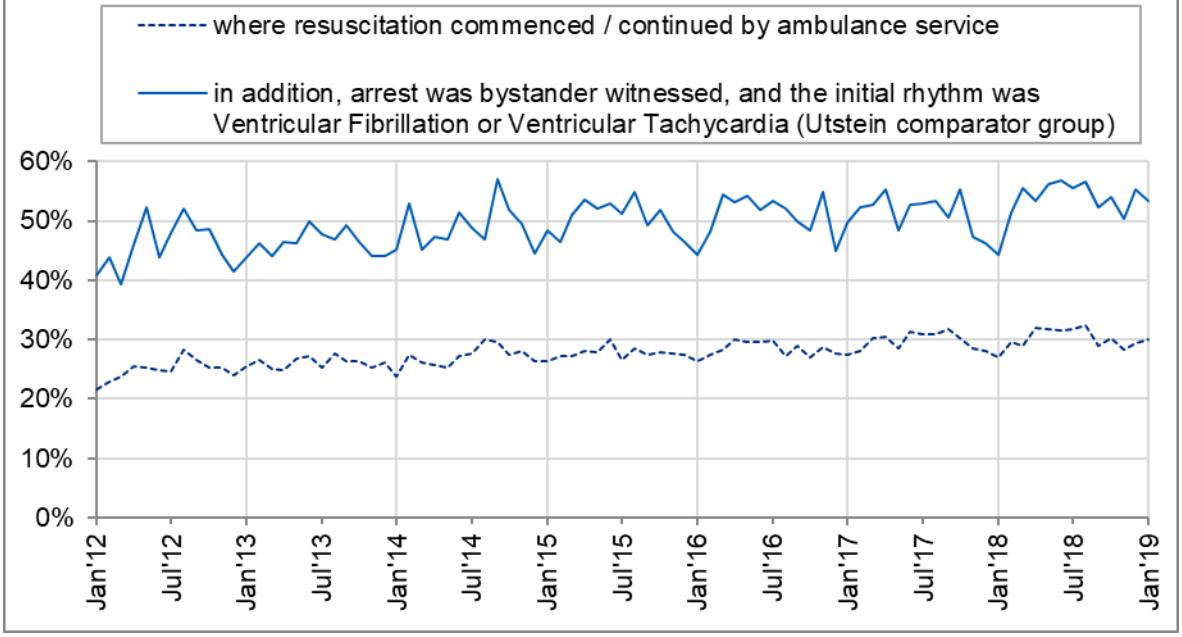
Today we describe the cardiac arrest (section 2.1) and STEMI (section 2.2) data for January 2019. Section 3 then summarises the revisions to all Clinical Outcomes data.

2.1 Cardiac arrest

Patients in cardiac arrest will typically have no pulse and will not be breathing. We show, of patients for whom resuscitation was commenced or continued by ambulance staff out-of-hospital, how many had return of spontaneous circulation (ROSC), with a pulse, on arrival at hospital (Figure 6), and how many survived to be discharged from hospital (Figure 7).

Starting from April 2018, these data are supplied by Ambulance Services via the University of Warwick Out of Hospital Cardiac Arrest Outcomes (OHCAO) study, rather than directly to NHS England.

Figure 6: Return of spontaneous circulation (ROSC)
on arrival at hospital following cardiac arrest



For all patients, in January 2019, at England level, ROSC (Figure 6) was 30%, the same as for the year ending September 2018.

For the Utstein group, ROSC was 53%, which similar to the average for the year ending September 2018, 52%. The Utstein comparator group[2] comprises patients with an out-of-hospital cardiac arrest of presumed cardiac origin, where the arrest

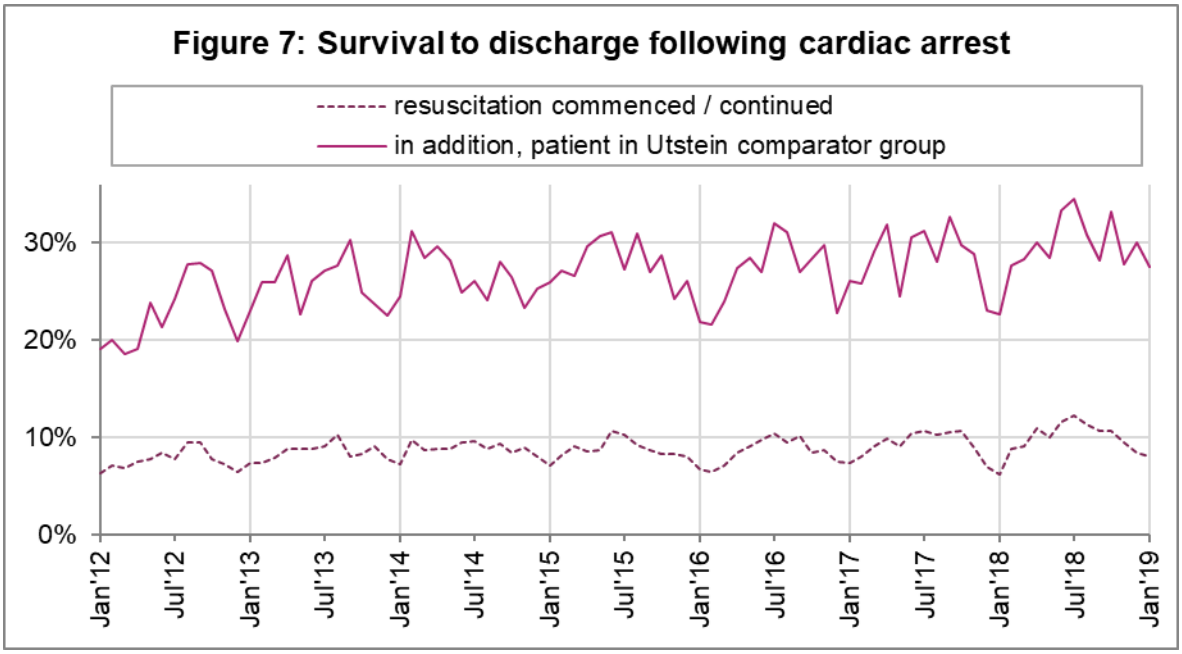
[2] This definition was proposed at Utstein Abbey in Norway by an international group of cardiologists and other health professionals in 1990. http://circ.ahajournals.org/content/110/21/3385

was bystander witnessed, and the initial rhythm was Ventricular Fibrillation or Ventricular Tachycardia. This group therefore have a better chance of survival.

For patients with ROSC in January 2019, 66% received the post-ROSC care bundle. This proportion is the same as the previous data, which were for October 2018.

Survival to discharge was 8% for all patients in January 2019, and 28% for the Utstein group (Figure 7). These proportions were not significantly[3] different to the respective averages of 10% and 29% for the year ending September 2018.

Figure 7: Survival to discharge following cardiac arrest



2.2 ST-segment elevation myocardial infarction (STEMI)

STEMI is a type of heart attack, determined by an electrocardiogram (ECG) test. Early access to reperfusion, where blocked arteries are opened to re-establish blood flow, and other assessment and care interventions, are associated with reductions in STEMI mortality and morbidity.

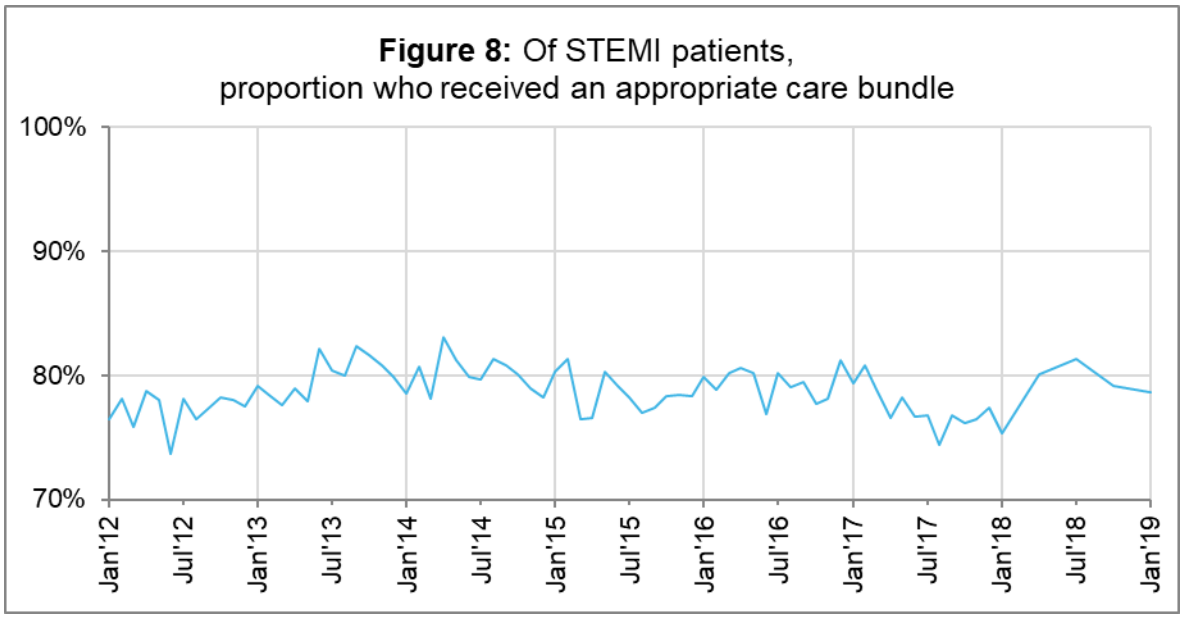
Starting with November 2017 data, the National Institute for Cardiovascular Outcomes Research (NICOR) have supplied data from their Myocardial Ischaemia National Audit Project (MINAP) for STEMI patients. These data include counts of patients and, for those patients, the time from ambulance call to insertion of a catheter for primary percutaneous coronary intervention (PPCI): inflation of a balloon inside a blood vessel to restore blood flow to the heart.

Across England for January 2019, the mean average time from call to catheter insertion was 2 hours 9 minutes, within three minutes of all the England averages for earlier months of 2018-19.

The 90th centile time from call to catheter insertion was 2:57. In the previous nine months, the 90th centiles for England ranged from 2:50 to 3:01.

[3] Calculated using Student's t-test with 95% significance.

Figure 8 shows that the proportion of patients with an acute STEMI in England in January 2019 that received an appropriate care bundle was 79%. This was similar to the average for the year ending September 2018 (78%).



3. Clinical Outcome Revisions

All eleven Ambulance Services have revised data within the period November 2017 to December 2018. LAS also revised June 2017 STEMI care bundle data. These revised data are used in Section 2 above, and are summarised below.

3.1 Stroke: time from hospital arrival to CT scan or thrombolysis

Starting with November 2017 data, times from hospital arrival to CT scan and thrombolysis for stroke have been supplied by the Sentinel Stroke National Audit Programme (SSNAP), who receive data from NHS Ambulance Services and Acute Trusts.

Previously, in this publication, for some Ambulance Service areas, for some months, the mean and 90th centile times to CT scan have been similar. This reflects a skew in the data distribution, caused by small numbers of patients that have very long times from hospital arrival to CT scan. These could be because, upon admission, the stroke was not evident, or there were more severe conditions needing attention. These rare occurrences distort comparisons over time.

Therefore, in consultation with data users and providers, we have changed the definition to only include times to CT scan up to 1000 minutes, a threshold already in use for the STEMI times to PPCI in section 2.2.

Using this new definition, SSNAP have revised the time series back to November 2017, and extended the series back to August 2017.

At England level, the new definition has reduced the monthly count of CT scans from about 4,900 to 4,800. Monthly median times have typically reduced by two minutes and remain close to 40 minutes. 90th centile times, previously around 4 hours, are

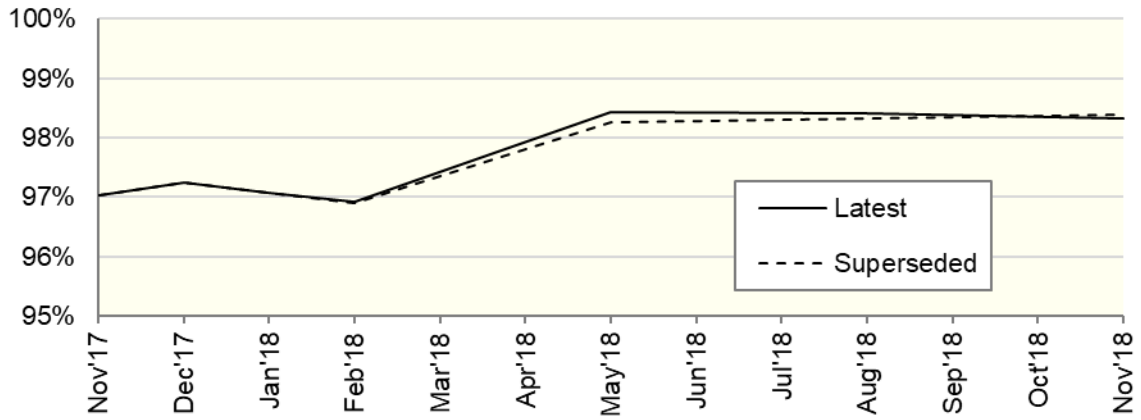
now typically about half an hour less; and mean average times, previously around 3 hours, are now typically about half as large.

We have not altered the definition for time from hospital arrival to thrombolysis, where a skew is not apparent. Those data are not revised, other than the addition of missing Isle of Wight data for November 2017.

3.2 Stroke: before hospital arrival

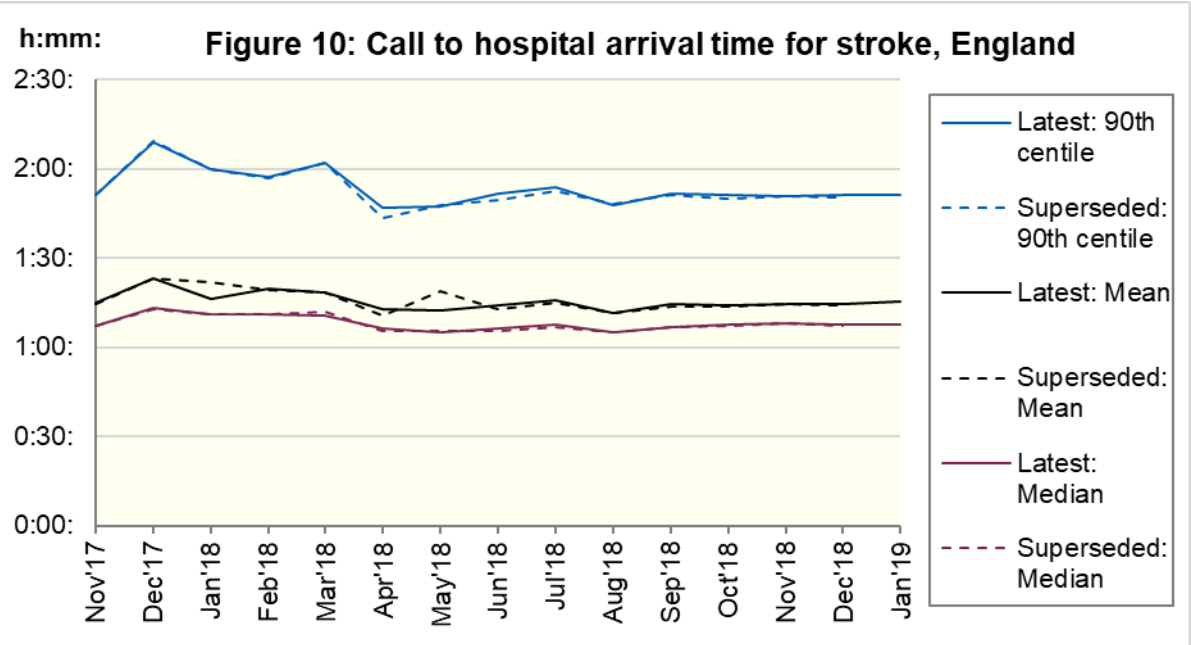
At England level, revisions to the proportion of stroke patients receiving a diagnostic bundle were all 0.2 percentage points or less (Figure 9).

Figure 9: Stroke patients receiving diagnostic bundle, England



The April and June 90th centiles were revised by more than 2 minutes, the January and May 2018 mean times from call to hospital arrival for stroke were revised by more than 5 minutes, and the March median was revised by more than 1 minute (Figure 10).

Figure 10: Call to hospital arrival time for stroke, England



3.3 Cardiac arrest

At England level, the only cardiac arrest proportions revised by more than 2 percentage points were survival to discharge from hospital (Figure 12), for the Utstein group, for June, August, and September 2018.

Figure 11: Cardiac arrest patients with ROSC, England

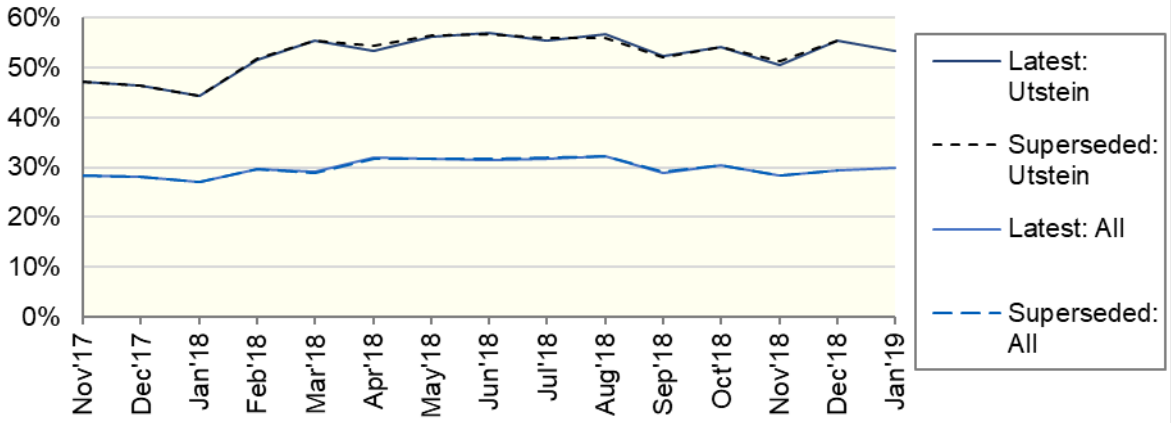
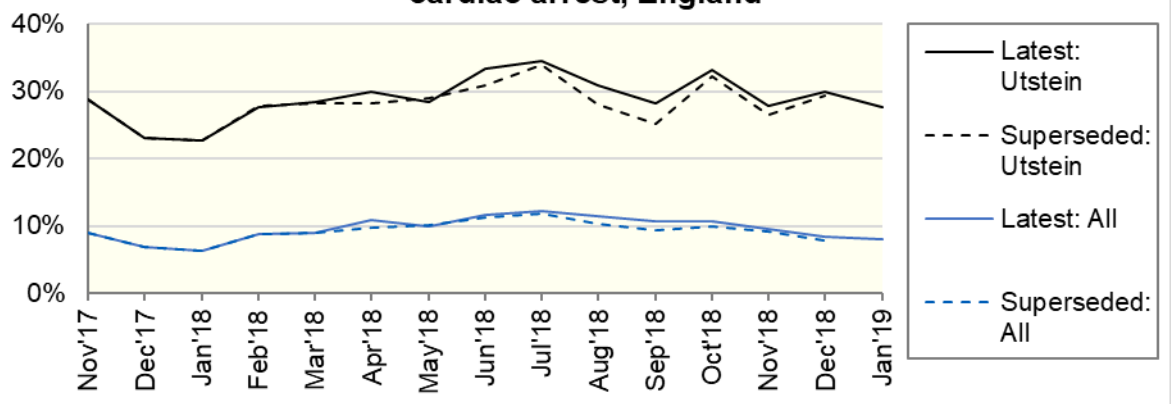


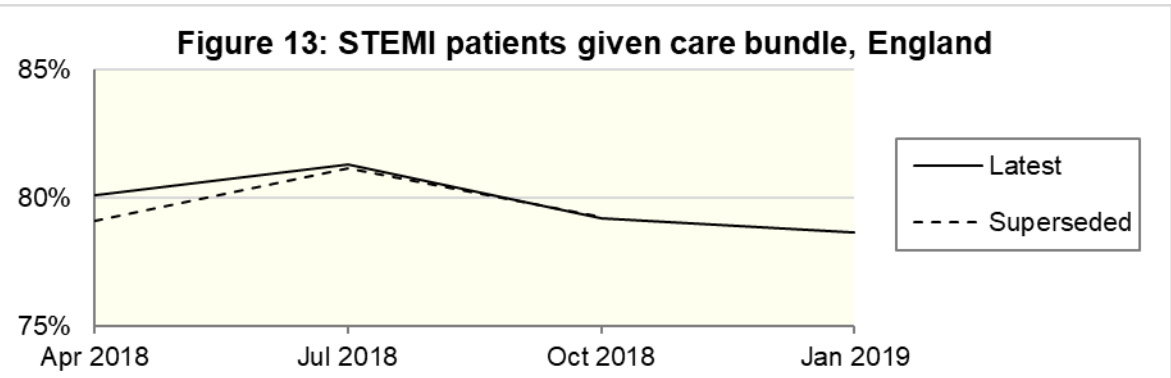
Figure 12: Survival to discharge from hospital, following cardiac arrest, England



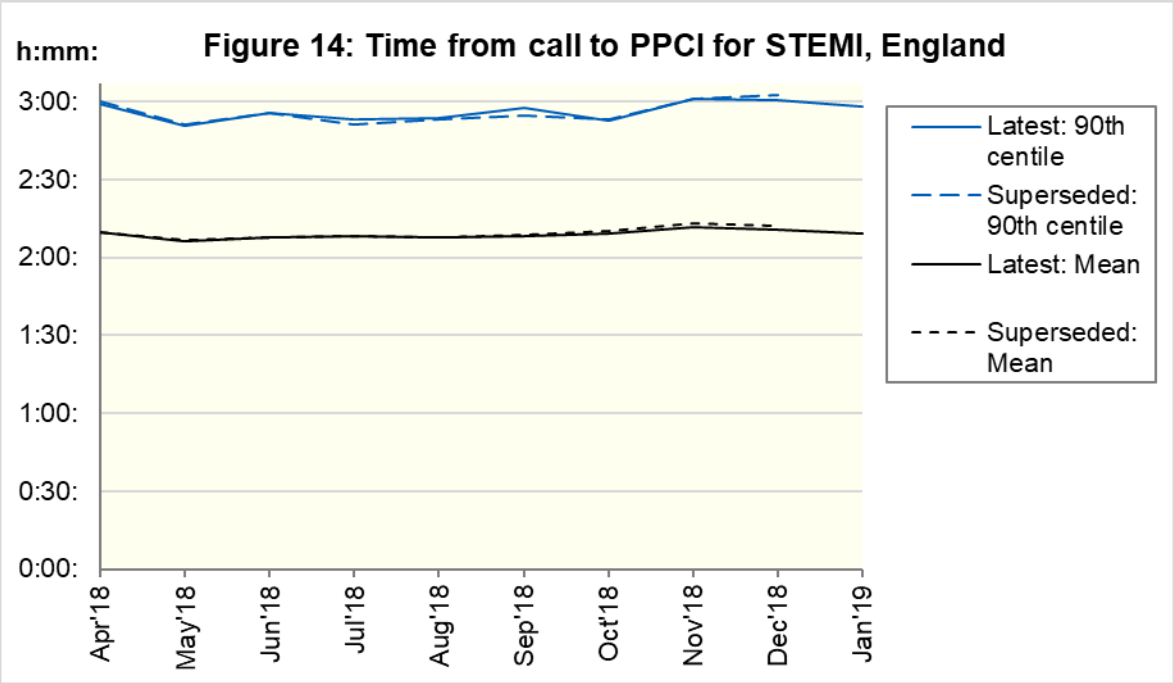
3.4 STEMI

Revisions to STEMI data were only made from April 2018 onwards, except for LAS June 2017 care bundle data. For the proportion of STEMI patients given a care bundle, at England level (Figure 13), April 2018 saw the greatest change, with an increase of 1 percentage point.

Figure 13: STEMI patients given care bundle, England



At England level, in each month, the mean average and 90th centile times from call to PPCI for STEMI were revised by less than 2%. The largest revision was an increase of three minutes to the 90th centile time for September 2018 (Figure 14).



3.5 Tables of largest revisions[4]

Figure 15: Revisions at England-level to times (h:mm) of more than 2%, and revisions to proportions of more than 2 percentage points

Indicator	Month	From	To	Revision
Cardiac arrest survival (Utstein)	Jun 2018	30.9%	33.3%	2.5%
	Aug 2018	28.0%	30.9%	2.9%
	Sep 2018	25.2%	28.2%	3.0%
Stroke: mean time to hospital arrival	Jan 2018	1:22	1:16	-7.2%
	Apr 2018	1:10	1:12	3.1%
	May 2018	1:18	1:12	-7.9%
Stroke: 90th centile time to hospital arrival	Apr 2018	1:43	1:46	3.3%
	Jun 2018	1:49	1:51	2.3%
Sepsis care bundle	Jun 2018	68.2%	71.2%	3.1%
	Sep 2018	68.8%	72.5%	3.7%

[4] Revisions to time from hospital arrival to CT scan for stroke patients, following the change in methodology in section 3.1, affect all revised months and trusts, and so are not listed here. However, all revised data are available in the spreadsheets and text file on the AQI website.

Figure 16: Revisions to Trust-level times (h:mm) of more than 20%, and revisions to proportions of more than 20 percentage points

Trust	Indicator	Month	From	To	Revision
EEAST	Stroke: Mean time to hospital arrival	Jan 2018	3:10	1:14	-60.9%
		May 2018	2:38	1:13	-53.7%
	Stroke: Median time to hospital arrival	Mar 2018	1:04	0:47	-26.6%
		Apr 2018	1:33	1:04	-31.6%
EMAS	Sepsis care bundle	Jun 2018	42.0%	71.4%	29.4%
		Sep 2018	36.6%	70.7%	34.2%
IOW	Post-ROSC care bundle	Jul 2018	0.0%	50.0%	50.0%
YAS	STEMI: 90th centile time to PPCI	Oct 2018	2:28	3:06	25.8%
	Stroke: 90th centile time to hospital arrival	Apr 2018	1:42	2:03	20.2%
		Jun 2018	1:40	2:03	22.8%
		Jul 2018	1:38	2:03	25.4%

4. Further information on AQI

4.1 The AQI landing page and Quality Statement

www.england.nhs.uk/statistics/statistical-work-areas/ambulance-quality-indicators, or http://bit.ly/NHSAQI, is the AQI landing page, and it holds:

- a Quality Statement for these statistics, which includes information on relevance, accuracy, timeliness, coherence, and user engagement;
- the specification guidance documents for those who supply the data;
- timetables for data collection and publication;
- time series spreadsheets and csv files from April 2011 up to the latest month;
- links to individual web pages for each financial year;
- contact details for the responsible statistician (also in 4.4 below).

The web pages for each financial year hold:

- separate spreadsheets of each month's data;
- this Statistical Note, and equivalent versions from previous months;
- the list of people with pre-release access to the data.

Publication dates are also at www.gov.uk/government/statistics/announcements?keywords=ambulance.

4.2 Related statistics

Ambulance handover delays of over 30 minutes at each Emergency Department were published by NHS England for winter 2012-13, 2013-14, 2014-15, 2017-18, and 2018-19, at www.england.nhs.uk/statistics/statistical-work-areas/winter-daily-sitreps.

The Quality Statement described in section 4.1 includes information on:

- a dashboard with an alternative layout for AQI data up to April 2016;
- the "Ambulance Services" publications[5] by NHS Digital, with data from before 2000, to 2014-15;
- the comparability of data for other countries of the UK:

Wales:	https://statswales.gov.wales/Catalogue/Health-and-Social-Care/NHS-Performance/Ambulance-Services
Scotland:	See Quality Improvement Indicators (QII) documents at www.scottishambulance.com/TheService/BoardPapers.aspx
Northern Ireland:	www.health-ni.gov.uk/articles/emergency-care-and-ambulance-statistics

4.3 AQI Scope

The AQI include calls made by dialling either the usual UK-wide number 999 or its international equivalent 112.

As described in the guidance mentioned in section 4.1, incidents resulting from a call to NHS 111 are included in all Systems Indicators except call data items A1 to A6.

4.4 Contact information

Media: NHS England Media team, nhsengland.media@nhs.net, 0113 825 0958.

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4.5 National Statistics

The UK Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods; and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

[5] https://digital.nhs.uk/data-and-information/publications/statistical/ambulance-services