



# TARN

THE TRAUMA AUDIT & RESEARCH NETWORK

MTC Example Hospital

## CLINICAL REPORT ISSUE 1 - MARCH 2021

I: CORE MEASURES FOR ALL PATIENTS

II: THORACIC & ABDOMINAL INJURIES 3+ RIB FRACTURES

PATIENTS IN SHOCK

Created on 22/03/2021

## EXECUTIVE SUMMARY

01 January 2020 to 31 December 2020 core measures

Improvements are shown in GREEN, no change in AMBER and deteriorations in RED. These are the areas you may want to review.

## Data quality and rate of survival

Meets  
targetCompared to  
previous year**Case Ascertainment is 100+**, this is **above** the target of 80%.This represents **no change** compared to previous year.**Data Accreditation is 97.3%**, this is **above** the target of 95%.This represents **no change** compared to previous year.**The excess rate of survival is better than expected****Ws is 0.93**. 95% confidence intervals are **0.14 to 1.72****The survivor /death ratio is 1.10**The data in this report should be viewed with **confidence** (see data reliability index)

n.b. Both Ws and survivor / death ratio are based on a 2 year period

## CORE section

Compared to  
MTC averageCompared to  
previous year**66% of ISS > 15 patients were seen by a Consultant within 5 minutes of arrival**, this is **above** the MTC average of 63.3% and has **decreased by 5%** compared to previous year.**83% of NICE criteria patients had a CT within 60 minutes**, this is **below** the MTC average of 88% and has **decreased by 11%** compared to previous year.*66% of the patients that had a CT within 60 minutes arrived between the hours of 08:00 - 20:00.***11 days median length of stay for ISS > 15 patients**, this is **within 1 day of** the MTC average of 10**Rehabilitation prescription was completed for 99% of patients with ISS >8**, this is **above** the MTC average of 90%. This has **increased by 6%** compared to previous year.

## THEMED section: Patients with 3+ rib fractures that were given pain relief\*

**106 minutes median time to pain relief**, this is **below** the MTC average of 226 minutes. This represents an increase of 24 minutes compared to previous year.**61% of patients were given pain relief pre hospital**, this is **above** the MTC average of 28%. This represents **no change** compared to previous year.**39% of patients were given pain relief in ED**, this is **below** the MTC average of 66%. This represents **no change** compared to previous year.

## BEST PRACTICE SPOTLIGHT

As agreed by the TARN Audit Committee, the Best Practice Spotlight is changing.

In advance of future reports TARN will approach Trusts or Networks who have shown significant improvement or who are consistently good in key areas, asking them to share information on how they have changed or improved things in this area.

Your Trust or Network may be contacted by TARN and asked to contribute to this feature for future reports.

## Contents

This Report contains the following sections:

1. **CORE** - includes ALL injured patients admitted in the time frames indicated.
2. **Thoracic, Abdominal & Shocked** - includes patients with thoracic injuries, abdominal injuries and those shocked.
3. **Appendix** - detailed information on individual patients (provided on request as a separate file).

### Core

- 1 - Case ascertainment & accreditation of patient data submission
- 2 - Accreditation breakdown
- 3 - Data reliability graph (where applicable)
- 4 - Case mix standardised rate of survival
  - Breakdown
  - Caterpillar plots
  - Funnel plots
  - Comparison against other network hospitals
  - Variable Life Adjusted Display
  - Rolling outcome analysis
- 5 - ISS & injury mechanism
- 6 - Pre-hospital care
- 7 - Number of patients with a GCS < 9 (pre-hospital or in the ED) and definitive airway management
- 8 - Most senior doctor attending patients within 5 minutes of arrival
- 9 - Most senior doctor attending patients within 30 minutes of arrival
- 10 - Most senior doctor attending patients in the emergency department
- 11 - Time to CT scanning
- 12 - Median time to CT scan per month for all patients
- 13 - Time to first operation
- 14 - Patient pathway & transfer between hospitals
- 15 - Length of stay in hospital
- 16 - Length of stay in, and readmissions to, critical care
- 17 - NICE Quality standards

### Thoracic, Abdominal & Shocked

- 1 - Thoracic injuries summary information
- 2 - Most senior doctor attending patients with AIS3+ thoracic injuries in the emergency department
- 3 - Time to CT or MRI scan for patients with AIS3+ thoracic injuries
- 4 - Abdominal Injuries summary information
- 5 - Presence & grade of general surgeon in the emergency department for patients with AIS3+ abdominal injuries
- 6 - Time to theatre for patients with AIS3+ abdominal injuries
- 7 - Grade of surgeon / anaesthetist performing the initial operaiton for patients with AIS3+ abdominal injuries
- 8 - Management of shocked patients
- 9 - Patients receiving tranexamic acid

Some sections may not appear if there is insufficient data

## Glossary

### Explanation of acronyms, abbreviations and other key terms used in this report.

<b>AIS</b>	Abbreviated Injury Scale score. A value between 1 (minor) and 6 (very severe) can be assigned to each injury. TARN currently uses the AIS 2005 system, the most recent available.
<b>BOAST 4</b>	British Orthopaedic Association Standard 4, setting out key markers for care of patients with high energy open lower limb fractures.
<b>Confidence interval</b>	Indicates the precision and possible range of a result. A wide confidence interval indicates the potential for large variation from the measured value because of small sample size. The larger the sample, the smaller the confidence intervals. The smaller the confidence intervals, the more precise the measured value.
<b>Direct admissions</b>	Describes care in the first treating hospital.
<b>ED</b>	Emergency Department.
<b>GCS</b>	Glasgow Coma Scale. A measure of consciousness ranging from 3, indicating complete unconsciousness, to 15, indicating a state of normal alertness. GCS is composed of eye, verbal and motor scores.
<b>HES / HIPE / PEDW</b>	Hospital Episode Statistics / Hospital In-Patient Enquiry Scheme / Patient Episode Database Wales. Data collected in hospitals on all admissions. This data is used by TARN to produce an expected number of TARN eligible patients.
<b>Interquartile range</b>	Range of values within a selection of data excluding the top 25% and bottom 25%. This filters out unusually high and unusually low values and shows where the most significant values in the data range are concentrated.
<b>Intubation</b>	The insertion of a flexible plastic tube into the trachea to support a patient's airway.
<b>ISS</b>	Injury Severity Score. A score ranging from 1, indicating minor injuries to 75, indicating very severe injuries that are very likely to result in death. An ISS between 9 and 15 is considered moderate. An ISS of 16 or more is considered severe. ISS is calculated using the Abbreviated Injury Scale (AIS).
<b>Median</b>	The middle value in a range. Less easily distorted by very high or very low values than other aggregation methods, such as the mean.
<b>NICE</b>	National Institute for Health and Care Excellence. This organisation sets standards for patient care including for severe head injury, defined here as patients with any head injury and a Glasgow Coma Score (GCS) of less than 13.
<b>Paediatric</b>	Patients under 16 years of age at time of admission.
<b>RTC</b>	Road traffic collision.
<b>STR</b>	Specialist Trainee.
<b>TARN fraction</b>	The proportion of TARN patients in each PS band. Used as a weight to standardise hospital outcome performance according to case mix.
<b>Thoracotomy</b>	A surgical incision made into the pleural space of the chest.
<b>W</b>	Variable showing hospital outcome performance. W represents excess deaths or survivors per 100 patients. This is calculated using observed and expected survivors and the total number of patients in the hospital's rate of survival dataset. See rate of survival breakdown section of report for full formula.
<b>Ws</b>	Excess deaths or survivors (W) standardised according to hospital case mix using the TARN fraction. A hospital with the same case mix as the overall TARN population will have identical W and Ws values. A hospital whose case mix differs from the overall TARN population will have different W and Ws values.



# TARN

THE TRAUMA AUDIT & RESEARCH NETWORK

Example MTC Hospital

## SECTION I

### CORE MEASURES FOR ALL PATIENTS



## Case Ascertainment & Accreditation

If case ascertainment is low then the analysis in the rest of the report may not be reflective of true practice.

Trust / Hospital	01 January 2020 to 31 December 2020				01 January 2019 to 31 December 2019			
	N	E	C (%)	A (%)	N	E	C (%)	A (%)
NHS Trust	391	610 - 742	52.7 - 64	83.9	416	610 - 742	56.1 - 68.1	92.9
Hospital	135	241 - 286	47.2 - 56.1	69	31	241 - 286	10.8 - 12.9	90.1
Hospital	256	370	69.2	92	385	370	100+	93.2
<b>NHS Trust</b>	<b>1490</b>	<b>1450</b>	<b>100+</b>	<b>97.3</b>	<b>1565</b>	<b>1450</b>	<b>100+</b>	<b>97.1</b>
NHS Trust	390	421	92.6	95.0	452	421	100+	97.2
NHS Trust	503	817	61.5	96.2	546	817	66.8	92.6
Hospital	267	458	58.3	98	203	458	44.3	89.3
Hospital	236	359	65.7	95	343	359	95.5	94.6
NHS rust	232	274 - 325	71.4 - 84.8	91.1	308	274 - 325	94.8 - 100+	90.4
NHS Trust	421	1207	34.9	97.4	377	1207	31.2	85.2
Hospital	420	420	100+	92	438	420	100+	88.0
Hospital	421	414	100+	97	377	414	91.1	85.2
Hospital	362	373	96.9	96	362	373	96.9	95.5
NHS Trust	487	735	66.2	92.3	719	735	97.8	93.0
NHS Trust	611	561	100+	98.0	678	561	100+	97.5
Hospital	144	158	91.3	98	171	158	100+	97.6
Hospital	467	404	100+	98	507	404	100+	97.5
NHS Trust	302	306	98.6	90.2	276	306	90.1	91.7
NHS Trust	150	270	55.5	96.4	267	270	98.8	95.7
NHS Trust	357	264	100+	95.5	280	264	100+	96.8

**N** The number of approved submissions for the period

**E** The expected number of submissions for the period (from HES / HIPE / PEDW)

**C** The case ascertainment % for the period

**A** The accreditation % for the period

### HES / HIPE / PEDW

Hospital Episode Statistics / Hospital In-Patient Enquiry Scheme / Patient Episode Database Wales is the data collected in hospitals on all admissions. The TARN inclusion criteria is applied to this data to derive the expected number of cases for each site. Work with TARN participating sites has shown there is some over-estimation of cases in the results due to the variation in ICD10 coding.

The HES data used for the case ascertainment calculation is the same as the previous report. A notice will be added to the TARN website when the new HES data has been received.

### Case ascertainment

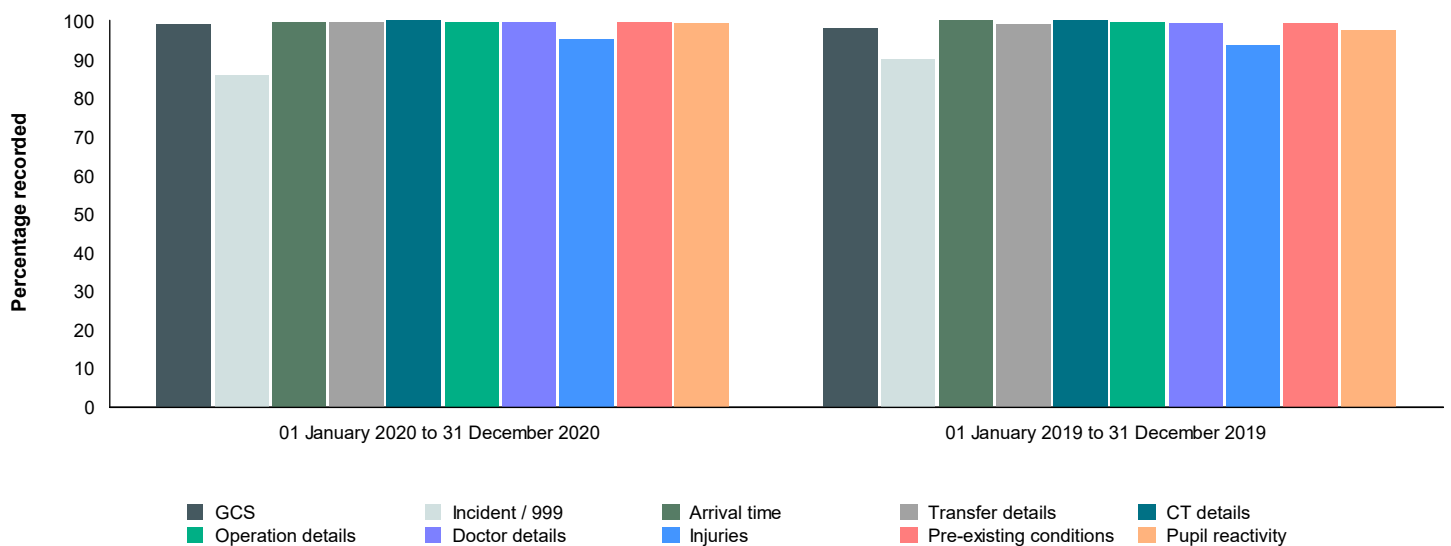
This is displayed as a percentage range and represents the number of patients submitted to TARN compared to the number of patients expected based on the HES dataset. The range represents the variance seen in the accuracy of the HES data. A single value is shown for hospitals that have provided feedback to TARN about their denominator.

### Accreditation

This is the proportion of key fields used in this report that are filled in for each patient submitted to TARN.

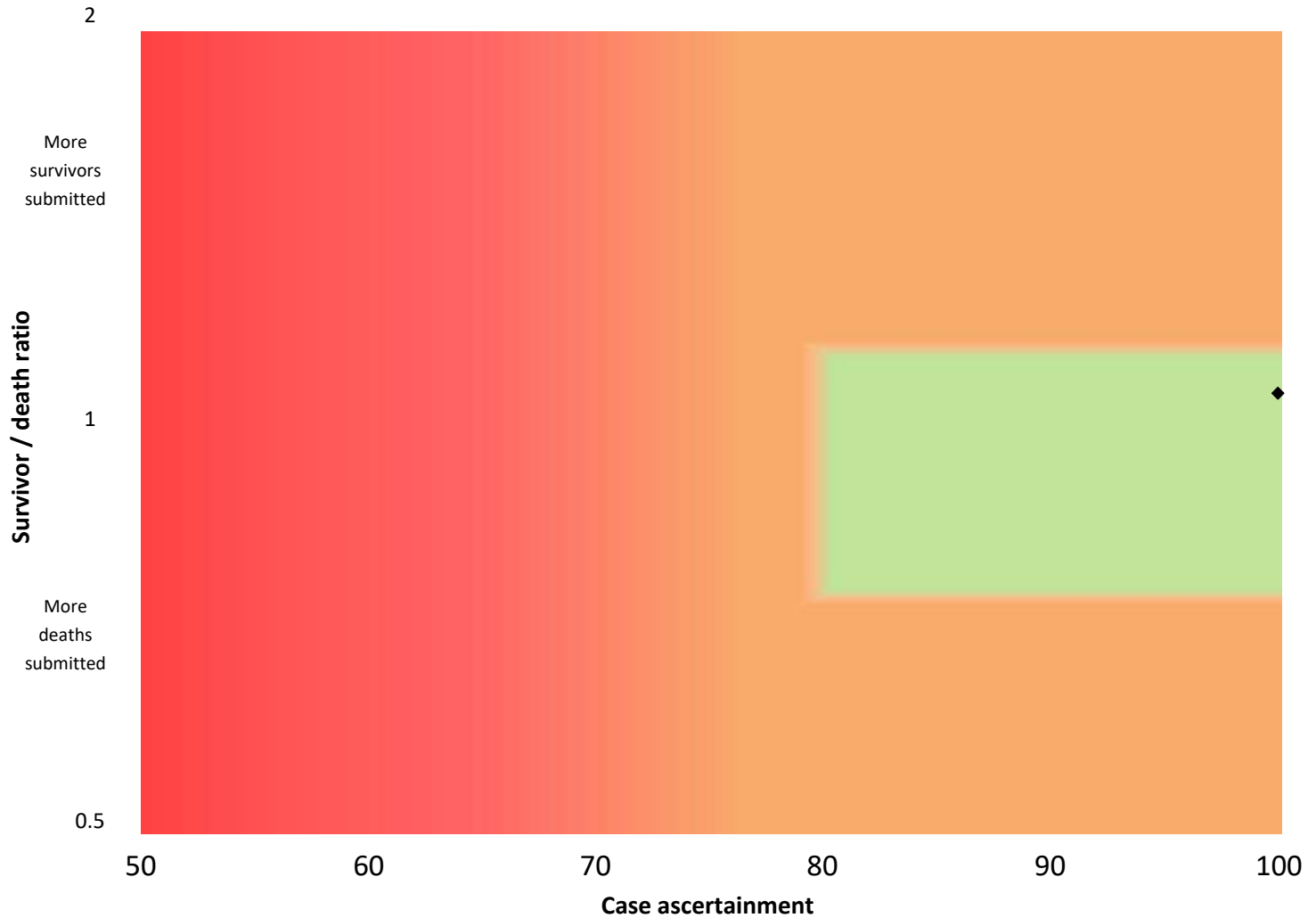
## Accreditation Breakdown

Component	01 January 2020 to 31 December 2020	01 January 2019 to 31 December 2019	Description
n	1490	1565	Number of patients
GCS	99.1%	98.0%	A GCS value or a recording of intubation / ventilation that can be used as part of the Ps calculation
Incident / 999 call details	85.8%	90.3%	Incident or 999 call date & time
Arrival time	99.9%	100.0%	Time of arrival at hospital
Transfer details	99.7%	99.2%	Reason for transfer & transfer request date
CT details	100.0%	100.0%	Date and time of recorded CT scan(s)
Operation details	99.8%	99.6%	Date and time, grade and speciality of surgeon and grade of anaesthetist for all recorded operations
Doctors in the ED	99.6%	99.6%	Date, time, grade and speciality of recorded ED doctor(s)
Injuries	95.2%	93.5%	Detailed injury descriptions
Pre-existing conditions	99.7%	99.3%	Information about pre-existing conditions
Pupil reactivity	99.5%	97.8%	Pupil reactivity for patients with AIS 3+ head injuries
<b>Accreditation Total</b>	<b>97.3%</b>	<b>97.1%</b>	



## Data reliability index -

Example Hospital is highlighted



### Example Hospital

Case ascertainment: **100+**

Survivor / death ratio: **1.10**

The data in this report should be viewed with **confidence**.

### Data reliability

Data reliability is measured using case ascertainment (if this is a range, the average of the two figures is used) and the survivor / death ratio for the report period. Survivor / death ratio is calculated as follows:

$$\frac{\text{survivors submitted} \div \text{expected number of survivors (HES)}}{\text{deaths submitted} \div \text{expected number of deaths (HES)}}$$

This ratio should be as close to 1 as possible. If it is above 1 it means proportionally more survivors are being submitted than deaths and if it is below 1 then proportionally more deaths are being submitted than survivors.

### Data confidence levels

**Confidence:** Case ascertainment **80+** and; survivor / death ratio between **0.8** and **1.2**

**Caution:** Case ascertainment **80+** and; survivor / death ratio **< 0.8** or **> 1.2**

**Extreme caution:** Case ascertainment **< 80**



## Example Hospital

## Case mix standardised excess rate of survival (Ws) &amp; Ws Breakdown

01 January 2019 to 31 December 2020

Patients who died at or were discharged from this hospital are eligible for Ws calculations. Patients who were transferred out from this hospital and not re-admitted are excluded.

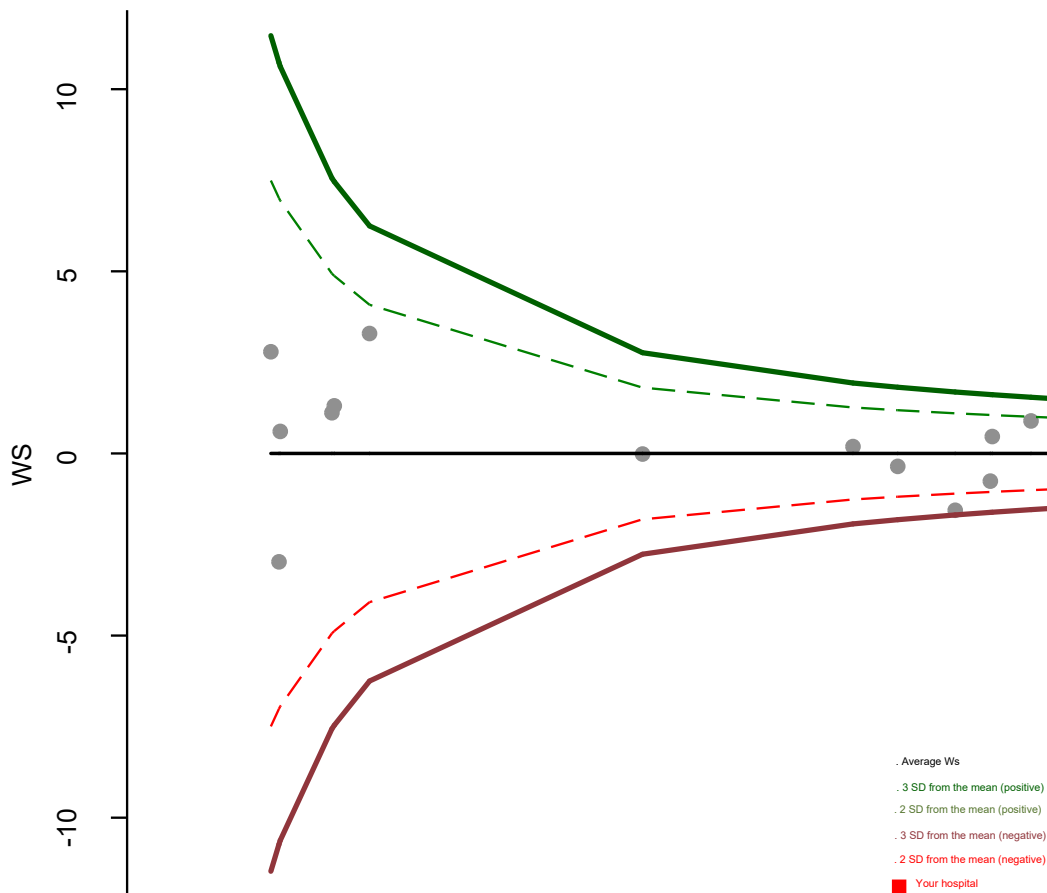
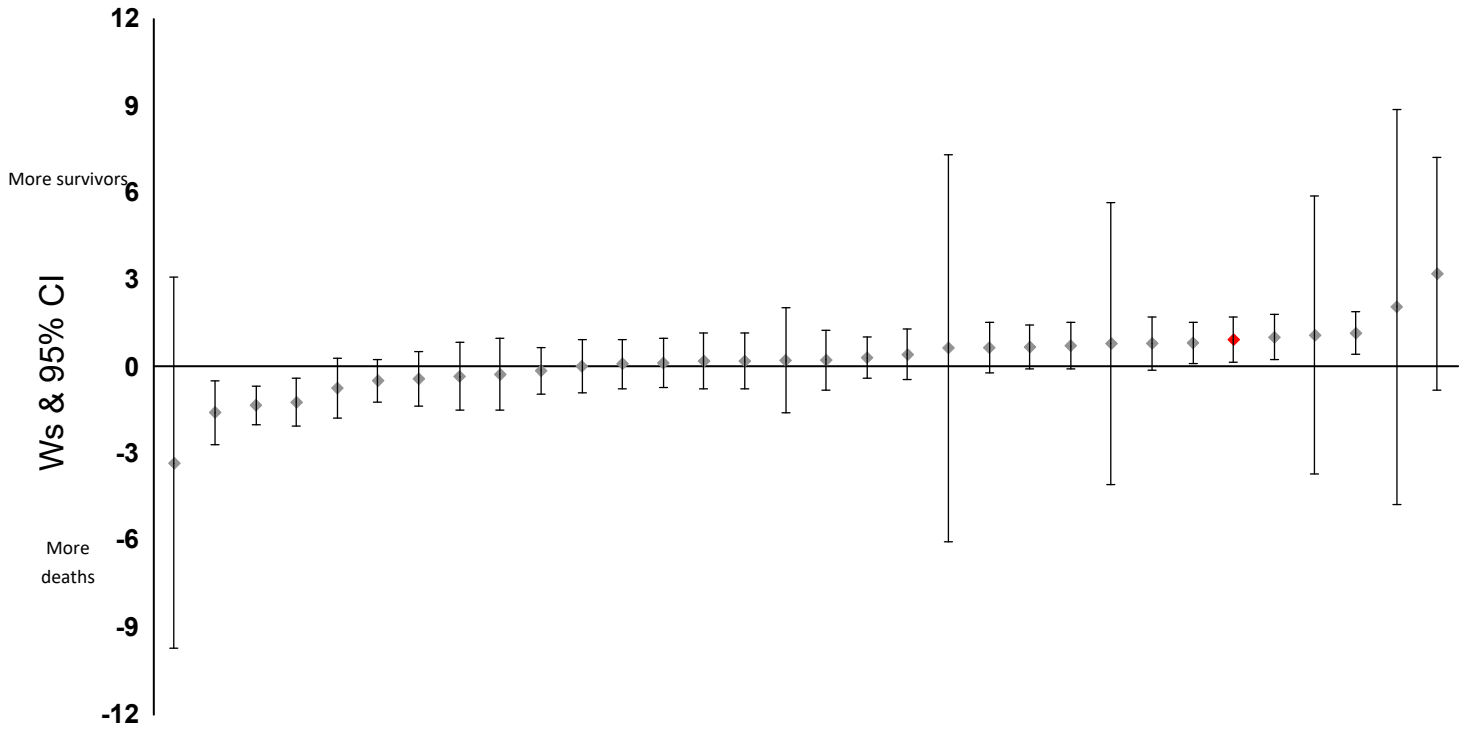
## Outcome at 30 days or discharge

PS Band	Number in band	Observed Survivors	Expected Survivors	Difference*	TARN fraction	Ws	95% confidence interval
95 - 100	1492	1473	1467.96	0.34	0.67	0.23	
90 - 95	399	371	370.63	0.09	0.16	0.01	
80 - 90	312	280	268.62	3.65	0.08	0.31	
65 - 80	134	101	98.63	1.76	0.04	0.07	
45 - 65	84	49	47.10	2.26	0.02	0.05	
25 - 45	66	34	23.58	15.78	0.02	0.25	
0 - 25	53	8	7.32	1.27	0.01	0.02	
<i>Total</i>	<i>2540</i>	<i>2316</i>	<i>2283.86</i>			<b>0.93</b>	<b>0.14 to 1.72</b>

Example Hospital  
 Major Trauma Centres  
 Comparative Outcome Analysis - 01 January 2019 to 31 December 2020  
 Outcome at 30 days or discharge

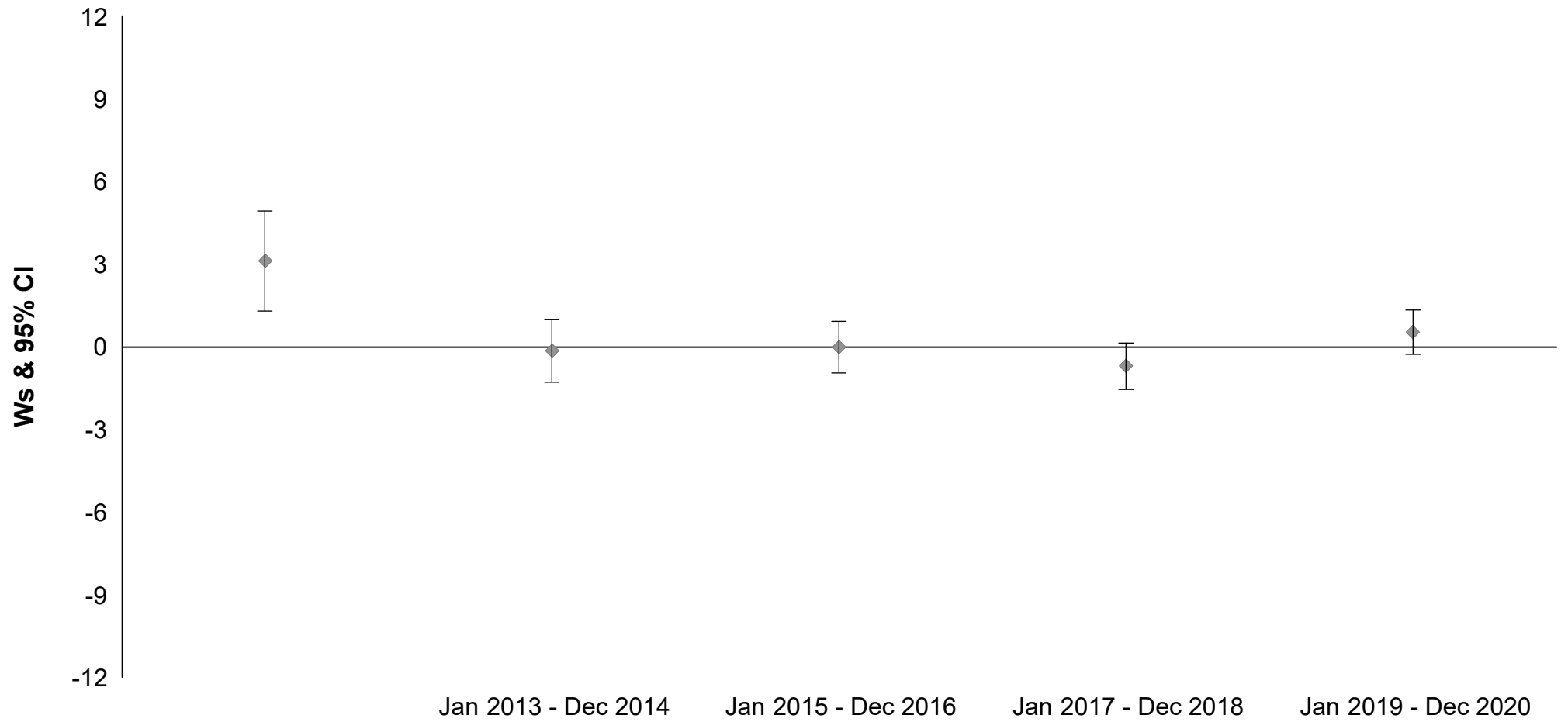
Example Hospital is highlighted

The Ws must be reviewed in conjunction with the Data Completeness and Accreditation figures.



Hospitals are plotted in order of precision (1/standard error)

Example Hospital  
Rolling Outcome Analysis  
Outcome at 30 days or discharge



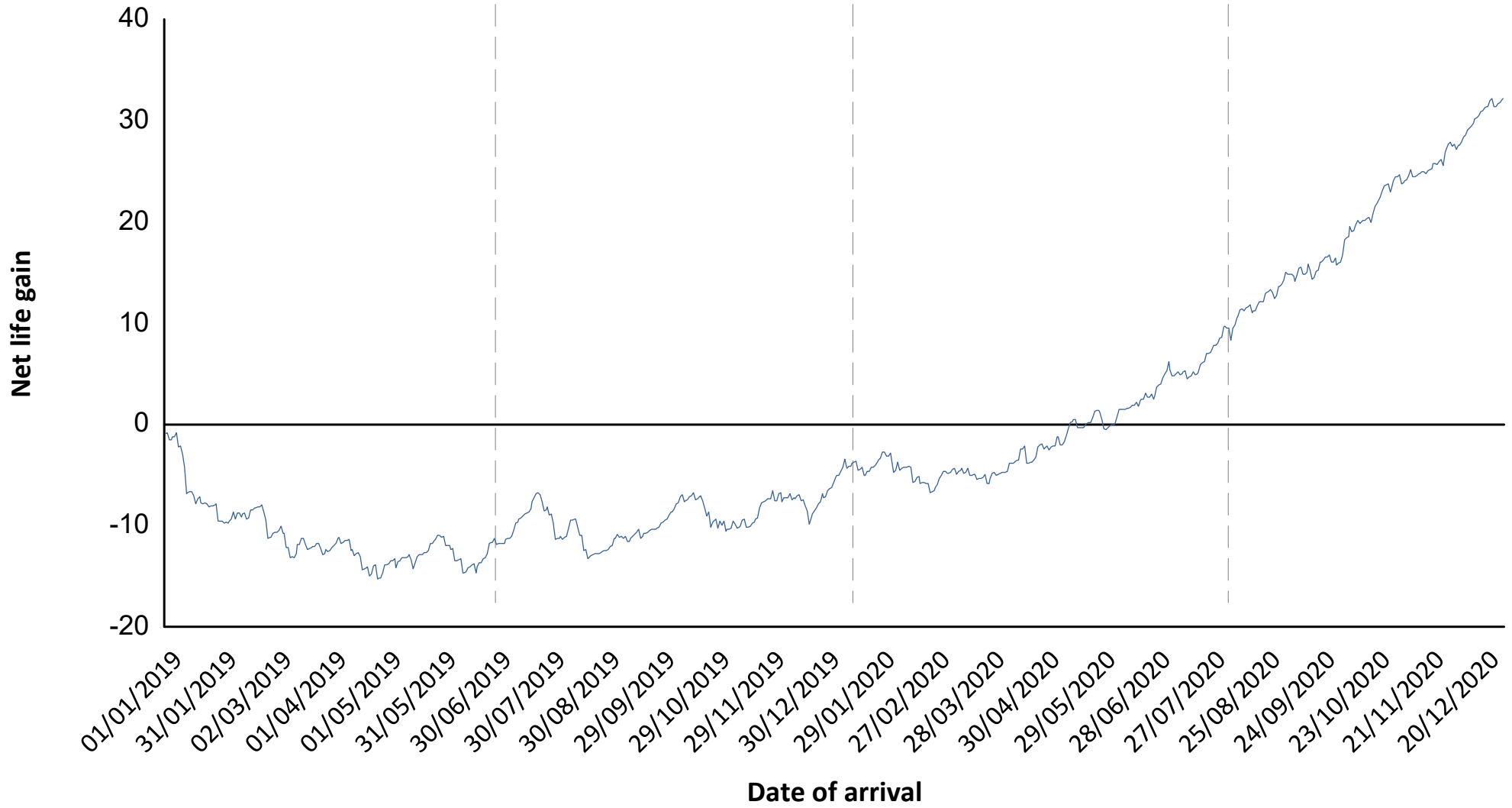
Example Hospital

Variable Life Adjusted Display (VLAD)

This chart must be reviewed in conjunction with the case ascertainment and SD ratio (where applicable) figures

Click [here](#) for information about how to interpret this chart.

Case ascertainment	100+	100+	95.6	100+
Survivor:Death ratio	0.79	1.26	0.98	1.44
Outstanding PMs	0	0	0	13



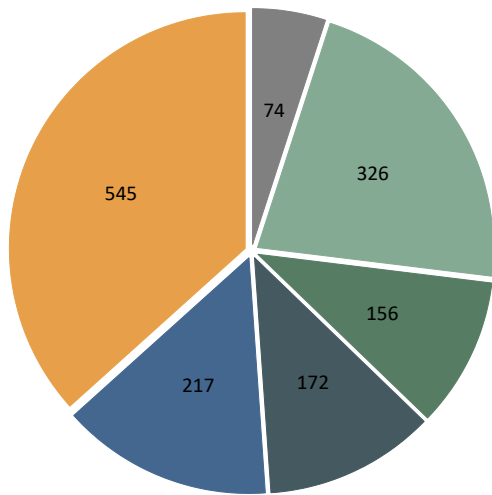
Example Hospital

Age & Injury Mechanism

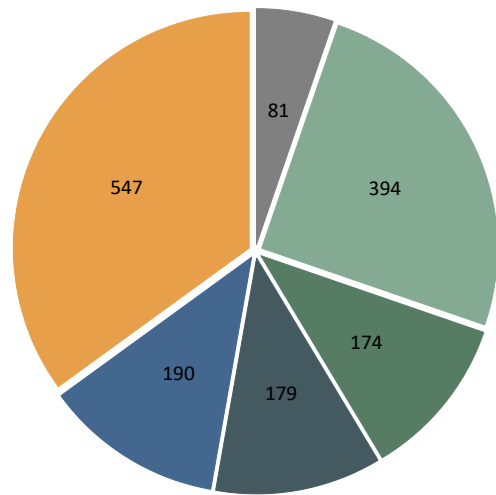
(row percentages)

Mechanism	Under 16	16 to 44	45 to 54	55 to 64	65 to 74	75 and over	Total
<b>01 January 2020 to 31 December 2020</b>							
RTC	26 (7.0%)	171 (45.8%)	66 (17.7%)	47 (12.6%)	35 (9.4%)	28 (7.5%)	373
Fall < 2m	20 (2.5%)	45 (5.6%)	52 (6.5%)	76 (9.4%)	133 (16.5%)	480 (59.6%)	806
Fall > 2m	6 (3.7%)	37 (22.8%)	19 (11.7%)	35 (21.6%)	34 (21.0%)	31 (19.1%)	162
Shooting / Stabbing	1 (2.9%)	25 (73.5%)	0 (0.0%)	4 (11.8%)	4 (11.8%)	0 (0.0%)	34
Other	21 (18.3%)	48 (41.7%)	19 (16.5%)	10 (8.7%)	11 (9.6%)	6 (5.2%)	115
<b>Total</b>	<b>74 (5.0%)</b>	<b>326 (21.9%)</b>	<b>156 (10.5%)</b>	<b>172 (11.5%)</b>	<b>217 (14.6%)</b>	<b>545 (36.6%)</b>	<b>1490</b>
<b>MTC average</b>	<b>4.2%</b>	<b>25.9%</b>	<b>9.6%</b>	<b>13.6%</b>	<b>11.9%</b>	<b>34.8%</b>	

<b>01 January 2019 to 31 December 2019</b>							
RTC	31 (6.5%)	211 (44.5%)	74 (15.6%)	70 (14.8%)	45 (9.5%)	43 (9.1%)	474
Fall < 2m	25 (3.2%)	54 (6.9%)	50 (6.4%)	66 (8.5%)	121 (15.5%)	465 (59.5%)	781
Fall > 2m	5 (3.4%)	34 (23.3%)	26 (17.8%)	29 (19.9%)	19 (13.0%)	33 (22.6%)	146
Shooting / Stabbing	4 (11.8%)	23 (67.6%)	5 (14.7%)	1 (2.9%)	0 (0.0%)	1 (2.9%)	34
Other	16 (12.3%)	72 (55.4%)	19 (14.6%)	13 (10.0%)	5 (3.8%)	5 (3.8%)	130
<b>Total</b>	<b>81 (5.2%)</b>	<b>394 (25.2%)</b>	<b>174 (11.1%)</b>	<b>179 (11.4%)</b>	<b>190 (12.1%)</b>	<b>547 (35.0%)</b>	<b>1565</b>
<b>MTC average</b>	<b>5.9%</b>	<b>28.1%</b>	<b>10.1%</b>	<b>11.9%</b>	<b>13.1%</b>	<b>30.9%</b>	



01 January 2020 to 31 December 2020



01 January 2019 to 31 December 2019

Under 16
  16 to 44
  45 to 54
  55 to 64
  65 to 74
  75 and over

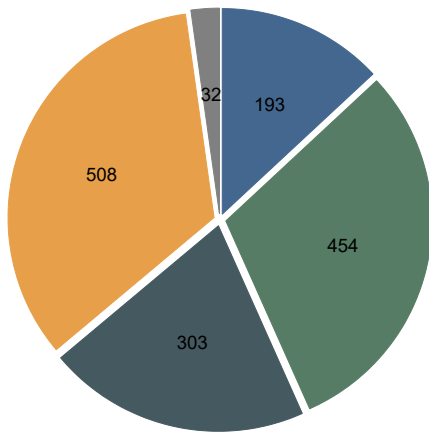
Example Hospital

ISS & Injury Mechanism

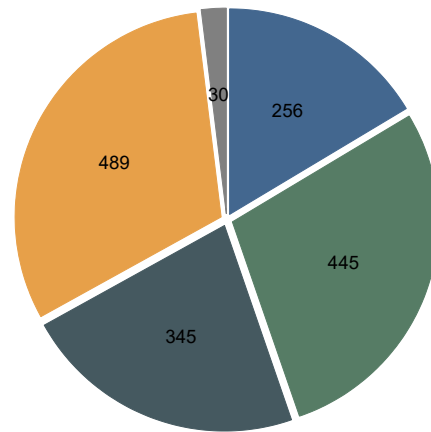
(row percentages)

Mechanism	1 - 8	9 - 15	16 - 24	25 - 45	>45	Total	>15
<b>01 January 2020 to 31 December 2020</b>							
RTC	39 (10.5%)	102 (27.3%)	81 (21.7%)	130 (34.9%)	21 (5.6%)	373	232 (62.2%)
Fall < 2m	127 (15.8%)	276 (34.2%)	157 (19.5%)	244 (30.3%)	2 (0.2%)	806	403 (50.0%)
Fall > 2m	14 (8.6%)	28 (17.3%)	29 (17.9%)	85 (52.5%)	6 (3.7%)	162	120 (74.1%)
Shooting / Stabbing	1 (2.9%)	14 (41.2%)	10 (29.4%)	9 (26.5%)	0 (0.0%)	34	19 (55.9%)
Other	12 (10.4%)	34 (29.6%)	26 (22.6%)	40 (34.8%)	3 (2.6%)	115	69 (60.0%)
<b>Total</b>	<b>193 (13.0%)</b>	<b>454 (30.5%)</b>	<b>303 (20.3%)</b>	<b>508 (34.1%)</b>	<b>32 (2.1%)</b>	<b>1490</b>	<b>843 (56.6%)</b>
<b>MTC average</b>	<b>14.3%</b>	<b>40.2%</b>	<b>21.1%</b>	<b>23.6%</b>	<b>0.8%</b>		<b>45.6%</b>

<b>01 January 2019 to 31 December 2019</b>							
RTC	42 (8.9%)	125 (26.4%)	118 (24.9%)	164 (34.6%)	25 (5.3%)	474	307 (64.8%)
Fall < 2m	180 (23.0%)	246 (31.5%)	145 (18.6%)	210 (26.9%)	0 (0.0%)	781	355 (45.5%)
Fall > 2m	13 (8.9%)	29 (19.9%)	39 (26.7%)	60 (41.1%)	5 (3.4%)	146	104 (71.2%)
Shooting / Stabbing	0 (0.0%)	20 (58.8%)	7 (20.6%)	7 (20.6%)	0 (0.0%)	34	14 (41.2%)
Other	21 (16.2%)	25 (19.2%)	36 (27.7%)	48 (36.9%)	0 (0.0%)	130	84 (64.6%)
<b>Total</b>	<b>256 (16.4%)</b>	<b>445 (28.4%)</b>	<b>345 (22.0%)</b>	<b>489 (31.2%)</b>	<b>30 (1.9%)</b>	<b>1565</b>	<b>864 (55.2%)</b>
<b>MTC average</b>	<b>14.4%</b>	<b>37.3%</b>	<b>21.9%</b>	<b>25.4%</b>	<b>1.1%</b>		<b>48.3%</b>



01 January 2020 to 31 December 2020



01 January 2019 to 31 December 2019

■ 1 - 8 ■ 9 - 15 ■ 16 - 24 ■ 25 - 45 ■ >45

## Example Hospital Pre-hospital care

Figures in blue represent the MTC average

### Direct admissions, 01 January 2020 to 31 December 2020

Number of patients: 880

Number of patients with pre-hospital data: 752

#### Level of personnel on scene

Doctor	Paramedic	Not recorded
214 (28.5%)	528 (70.2%)	10 (1.3%)
12.2%	85.7%	2.1%

#### Mode of transport to hospital

Ambulance	Helicopter	Self-presented	Not recorded*
622 (70.7%)	166 (18.9%)	92 (10.5%)	0 (0.0%)
81.3%	9.3%	9.3%	0.0%

### Direct admissions, 01 January 2019 to 31 December 2019

Number of patients: 934

Number of patients with pre-hospital data: 763

#### Level of personnel on scene

Doctor	Paramedic	Not recorded
236 (30.9%)	518 (67.9%)	9 (1.2%)
12.9%	84.1%	3.0%

#### Mode of transport to hospital

Ambulance	Helicopter	Self-presented	Not recorded*
573 (61.3%)	239 (25.6%)	122 (13.1%)	0 (0.0%)
78.7%	10.5%	10.8%	0.0%

\*Mode of transport not recorded may include patients that self-presented.

## Patients with GCS < 9 pre-hospital or in the ED and definitive airway management pre-hospital or in the ED

n	Definitive airway management	Pre-hospital	ED	Date & time recorded	Recorded within 30 mins of incident	Median time from incident (hours)
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### Direct admissions, 01 January 2020 to 31 December 2020

102	90 (88.2%)	79 (77.5%)	11 (10.8%)	89 (98.9%)	0 (0.0%)	1.9
	77.3%	42.9%	34.4%	89.5%	0.2%	1.42

### Direct admissions, 01 January 2019 to 31 December 2019

93	87 (93.5%)	75 (80.6%)	12 (12.9%)	86 (98.9%)	0 (0.0%)	2.0
	80.3%	44.0%	36.2%	89.4%	0.3%	1.40

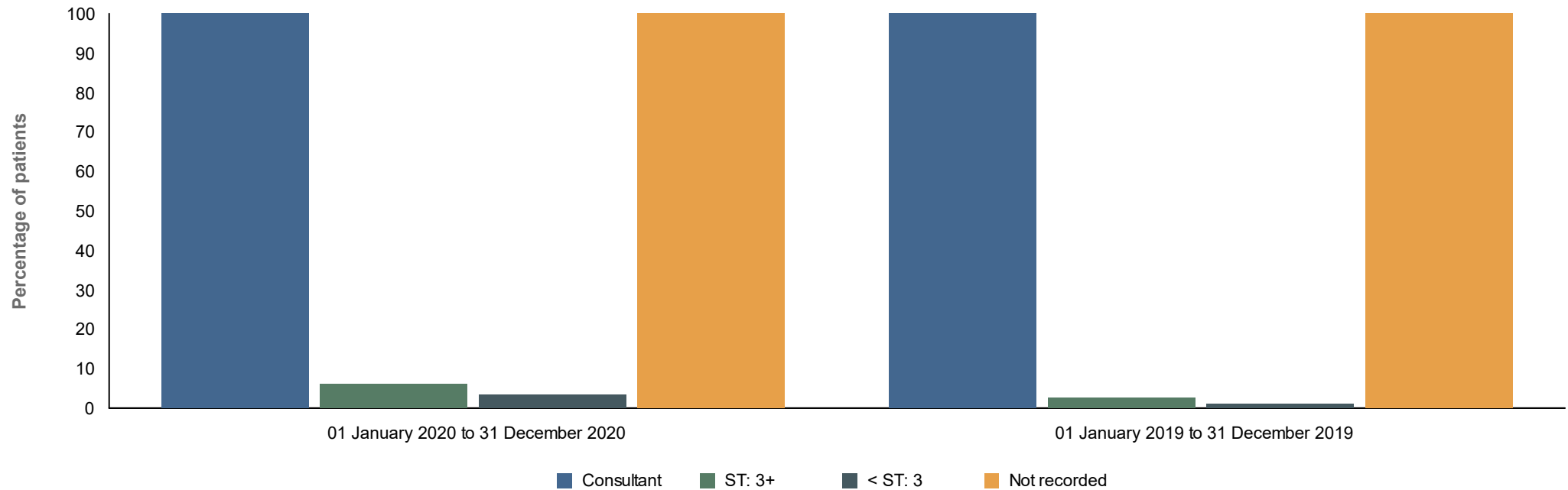
Definitive airway management is defined as the management of an airway using intubation, tracheostomy or cricothyroidotomy.

Example Hospital

**Most senior doctor seeing patients within 5 minutes of arrival**

All patients directly admitted, all specialities

Category	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
<b>01 January 2020 to 31 December 2020</b>						
All patients	880	393 (44.7%)	48.2%	13 (1.5%)	9 (1.0%)	465 (52.8%)
ISS > 15 patients	404	266 (65.8%)	63.3%	8 (2.0%)	3 (0.7%)	127 (31.4%)
Trauma team activated	266	263 (98.9%)	90.6%	2 (0.8%)	0 (0.0%)	1 (0.4%)
Trauma team not activated	614	130 (21.2%)	16.4%	11 (1.8%)	9 (1.5%)	464 (75.6%)
<b>01 January 2019 to 31 December 2019</b>						
All patients	934	469 (50.2%)	52.2%	5 (0.5%)	3 (0.3%)	457 (48.9%)
ISS > 15 patients	424	301 (71.0%)	68.1%	5 (1.2%)	1 (0.2%)	117 (27.6%)
Trauma team activated	289	286 (99.0%)	92%	0 (0.0%)	0 (0.0%)	3 (1.0%)
Trauma team not activated	645	183 (28.4%)	18.4%	5 (0.8%)	3 (0.5%)	454 (70.4%)



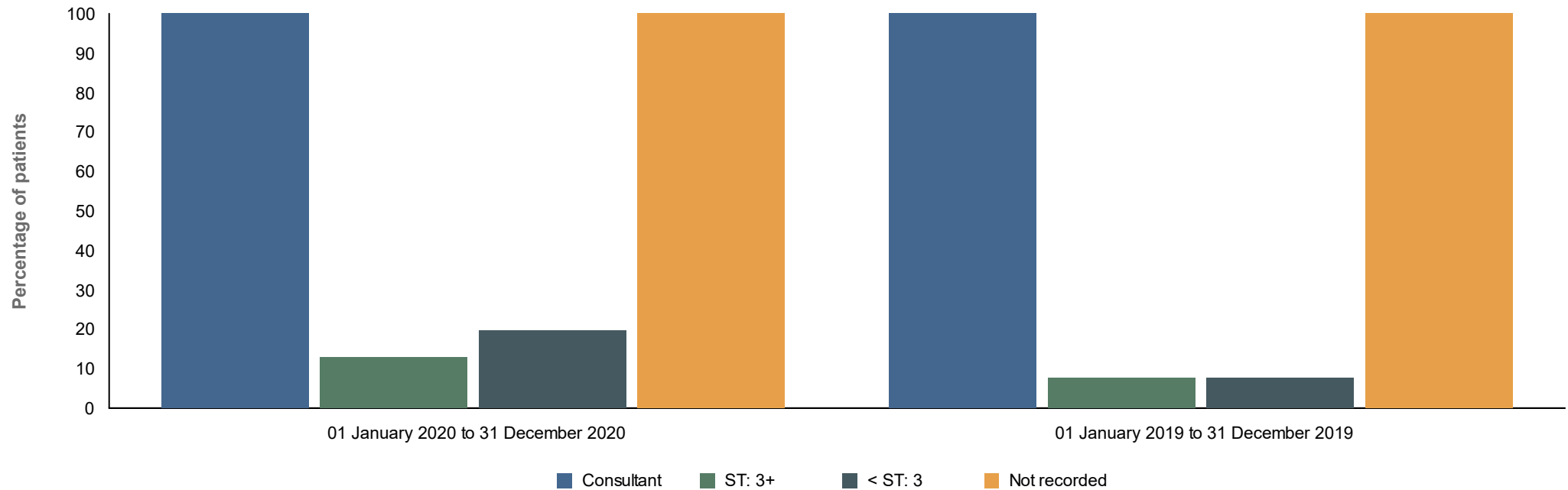


Example Hospital

**Most senior doctor seeing patients within 30 minutes of arrival**

All patients directly admitted, all specialities

Category	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
<b>01 January 2020 to 31 December 2020</b>						
All patients	880	414 (47.0%)	51.4%	32 (3.6%)	56 (6.4%)	378 (43.0%)
ISS > 15 patients	404	273 (67.6%)	65.9%	14 (3.5%)	16 (4.0%)	101 (25.0%)
Trauma team activated	266	264 (99.2%)	92.2%	2 (0.8%)	0 (0.0%)	0 (0.0%)
Trauma team not activated	614	150 (24.4%)	20.7%	30 (4.9%)	56 (9.1%)	378 (61.6%)
<b>01 January 2019 to 31 December 2019</b>						
All patients	934	500 (53.5%)	55.1%	19 (2.0%)	23 (2.5%)	392 (42.0%)
ISS > 15 patients	424	305 (71.9%)	70.1%	12 (2.8%)	6 (1.4%)	101 (23.8%)
Trauma team activated	289	287 (99.3%)	93.1%	0 (0.0%)	1 (0.3%)	1 (0.3%)
Trauma team not activated	645	213 (33.0%)	22.9%	19 (2.9%)	22 (3.4%)	391 (60.6%)

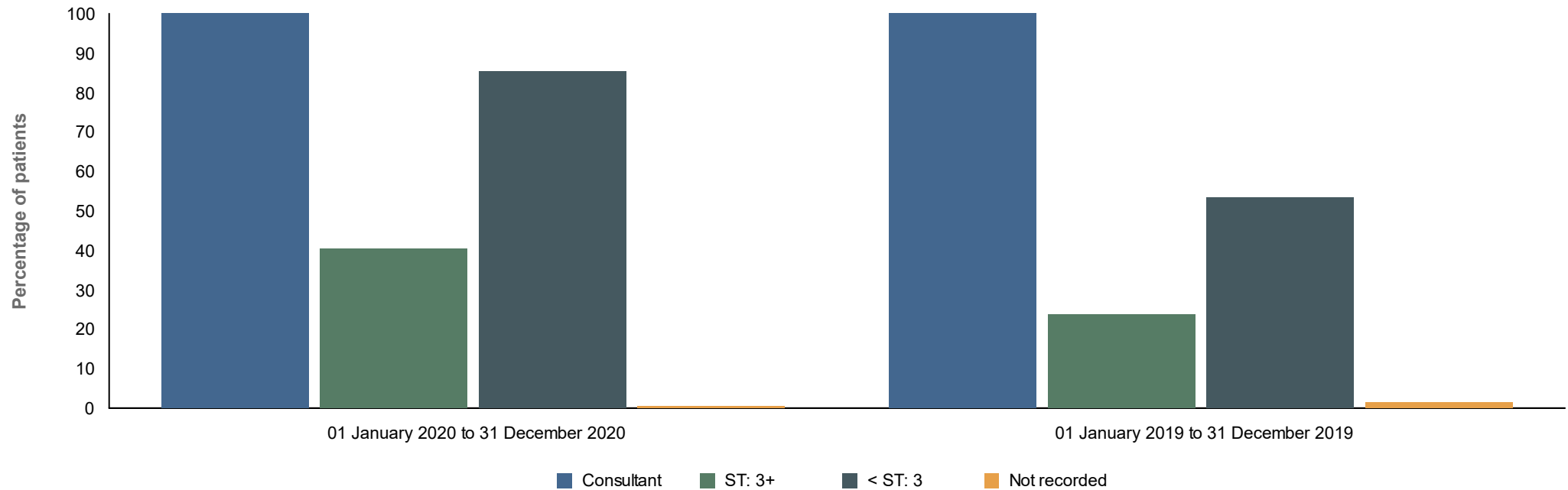


Example Hospital

**Most senior doctor seeing patients in the Emergency Department**

All patients directly admitted to the ED, all specialities

Category	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
<b>01 January 2020 to 31 December 2020</b>						
All patients	873	510 (58.4%)	61.6%	121 (13.9%)	240 (27.5%)	2 (0.2%)
ISS > 15 patients	402	303 (75.4%)	74.2%	26 (6.5%)	73 (18.2%)	0 (0.0%)
Trauma team activated	266	266 (100.0%)	94.4%	0 (0.0%)	0 (0.0%)	0 (0.0%)
Trauma team not activated	607	244 (40.2%)	36.2%	121 (19.9%)	240 (39.5%)	2 (0.3%)
<b>01 January 2019 to 31 December 2019</b>						
All patients	921	682 (74.0%)	66.2%	67 (7.3%)	167 (18.1%)	5 (0.5%)
ISS > 15 patients	418	358 (85.6%)	78.6%	24 (5.7%)	36 (8.6%)	0 (0.0%)
Trauma team activated	289	288 (99.7%)	94.7%	0 (0.0%)	1 (0.3%)	0 (0.0%)
Trauma team not activated	632	394 (62.3%)	41.2%	67 (10.6%)	166 (26.3%)	5 (0.8%)



## Example Hospital Time to CT scan

### Direct Admissions

(excluding patients with a time difference greater than 24 hours or taken directly to theatre)

Patient category	n (CT with date and time rec)	Median minutes to*			MTC median minutes to	
		CT	Provisional report	Final report	CT	Final report
<b>01 January 2020 to 31 December 2020</b>						
All Patients	672	78 (41 - 198)	18 (9 - 28)	474 (122 - 802)	53 (27 - 149)	258 (90 - 705)
AIS 3+ Head Injury	223	59 (38 - 137)	17 (8 - 31)	499 (123 - 819)	43 (24 - 100)	249 (88 - 701)
NICE head injury criteria	104	43 (29 - 59)	29 (21 - 38)	394 (114 - 801)	29 (19 - 43)	269 (96 - 716)
<b>01 January 2019 to 31 December 2019</b>						
All Patients	707	67 (30 - 198)	16 (7 - 27)	499 (124 - 816)	45 (25 - 150)	293 (90 - 748)
AIS 3+ Head Injury	250	51 (29 - 124)	14 (7 - 27)	450 (126 - 799)	37 (23 - 100)	277 (88 - 733)
NICE head injury criteria	110	30 (25 - 44)	24 (14 - 31)	575 (142 - 808)	26 (18 - 38)	303 (93 - 746)

#### Median time to CT

Time from hospital arrival to first CT scan

#### Median time to provisional report

Time from first CT scan to the provisional report being produced

#### Median time to final report

Time from first CT scan to the review of the provisional report by a consultant

\* N/A means there are not enough cases to calculate the median and interquartile range

## Example Hospital

**Time to first operation (emergency operations only)****Direct Admissions (excluding patients with a time difference greater than 24 hours)**

Patient category	n	Median minutes to operation*	MTC median minutes to operation
<b>01 January 2020 to 31 December 2020</b>			
All Patients	186	425 (173 - 920)	507 (185 - 998)
Head & Brain operations	37	329 (148 - 508)	226 (129 - 462)
Spinal operations	9	882 (729 - 1129)	791 (447 - 1129)
Chest operations	43	208 (140 - 360)	169 (86 - 360)
Abdominal operations	18	216 (156 - 400)	165 (93 - 314)
Limb operations	25	1144 (744 - 1283)	1051 (749 - 1253)
BOAST4 operations	13	886 (809 - 1024)	790 (403 - 1070)
Skin operations	38	877 (379 - 1137)	769 (338 - 1097)
General operations	3	N/A	155 (71 - 386)
<b>01 January 2019 to 31 December 2019</b>			
All Patients	199	517 (216 - 993)	460 (172 - 965)
Head & Brain operations	36	430 (190 - 713)	206 (127 - 430)
Facial operations	2	N/A	488 (205 - 991)
Spinal operations	10	996 (933 - 1153)	757 (435 - 1070)
Chest operations	41	258 (128 - 645)	185 (78 - 509)
Abdominal operations	23	235 (81 - 494)	168 (92 - 365)
Limb operations	20	982 (687 - 1139)	957 (567 - 1203)
BOAST4 operations	11	649 (583 - 838)	782 (328 - 1063)
Skin operations	53	824 (373 - 1150)	795 (337 - 1066)
General operations	3	N/A	159 (89 - 259)

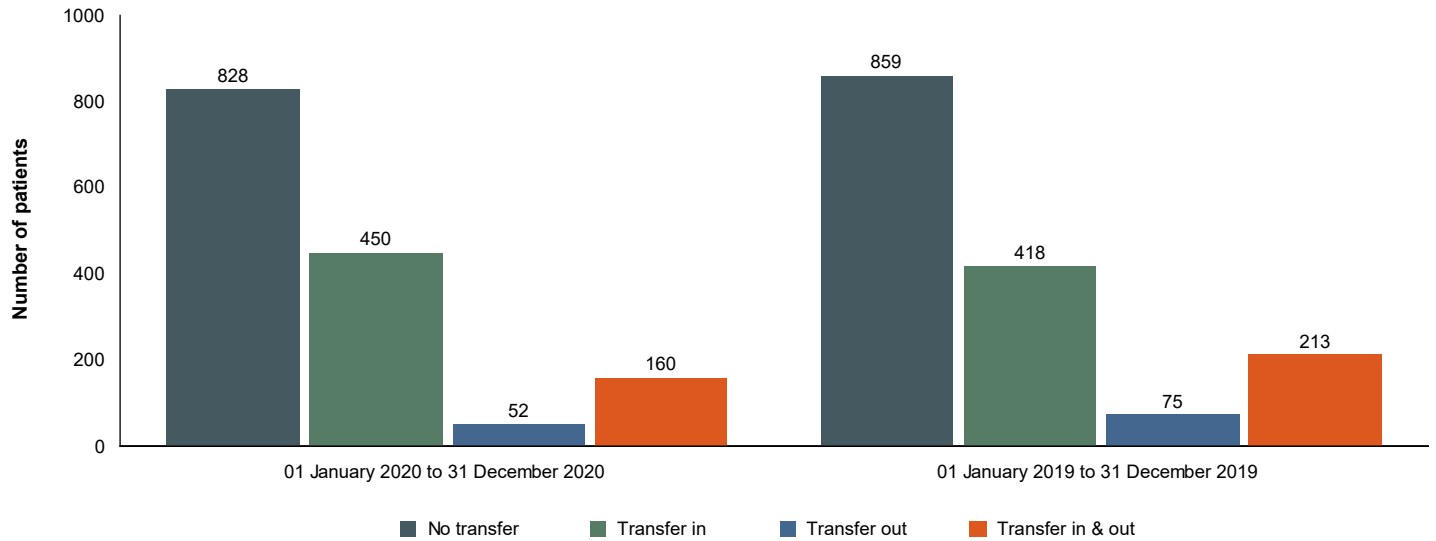
A list of the procedures defined as emergency operations is available from TARN on request.

\* N/A means there are not enough cases to calculate the median and interquartile range

## Example Hospital

## Transfer between hospitals

Date range	No transfer	Transfer in	Transfer out	Transfer in & out
01 January 2020 to 31 December 2020	828 (55.6%)	450 (30.2%)	52 (3.5%)	160 (10.7%)
01 January 2019 to 31 December 2019	859 (54.9%)	418 (26.7%)	75 (4.8%)	213 (13.6%)



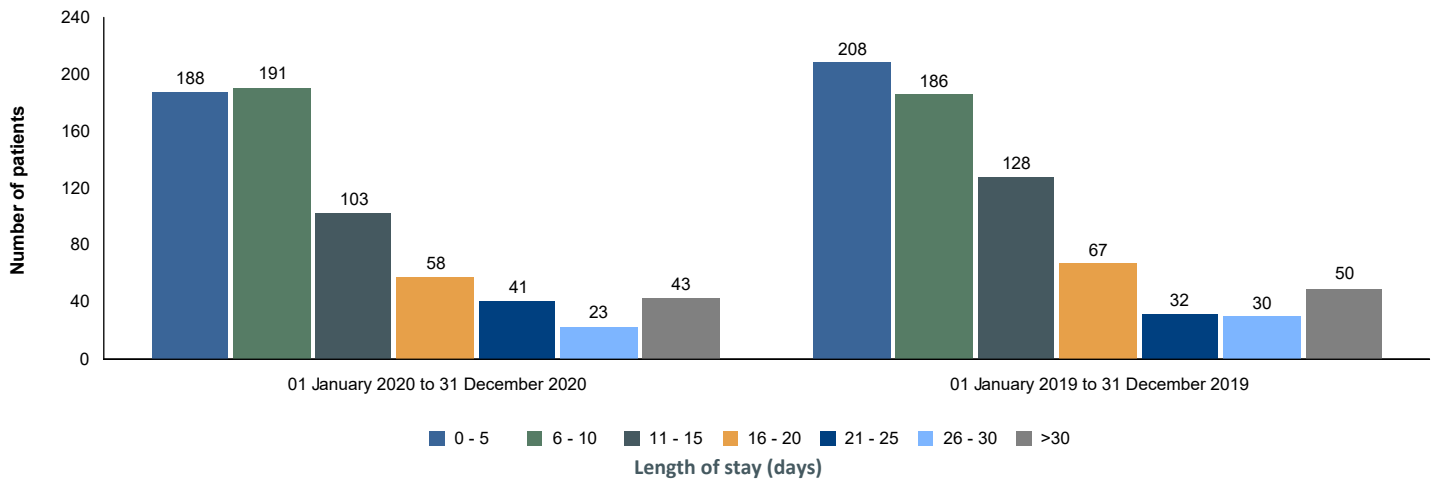
Example Hospital

Length of stay (LOS) in hospital

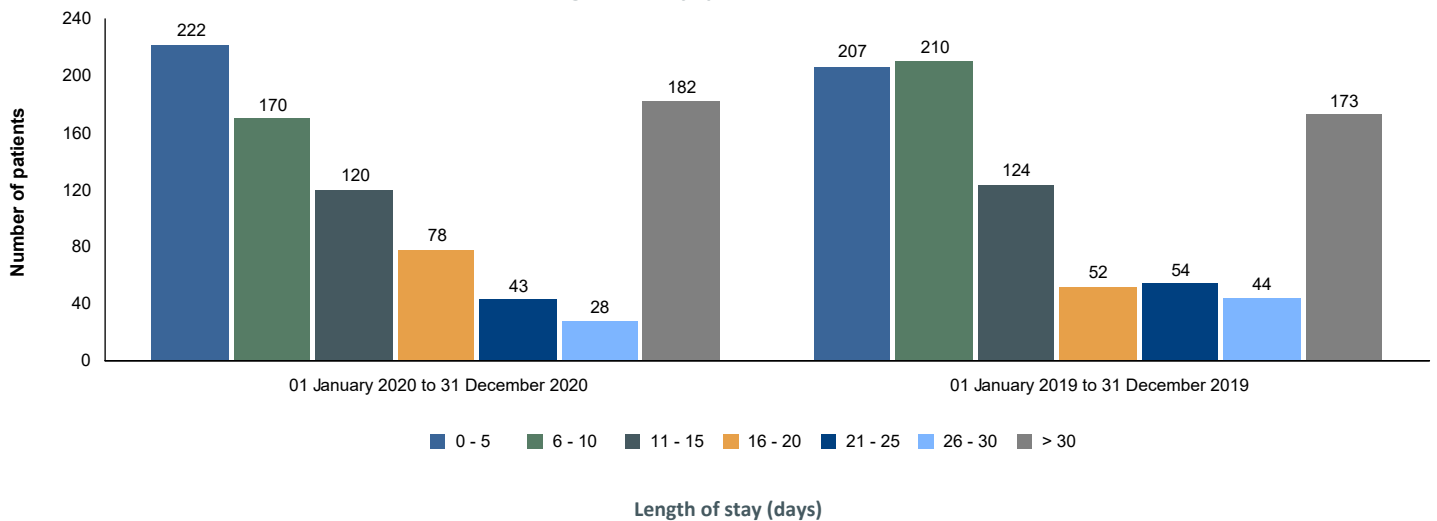
Date range	All patients			ISS <= 15			ISS > 15		
	n	Median LOS	Total days	n	Median LOS	Total days	n	Median LOS	Total days
01 January 2020 to 31 December 2020	1490	10 (5 - 20)	25710	647	9 (5 - 16)	8278	843	11 (5 - 25)	17432
MTC average		9 (5 - 16)			8 (5 - 14)			10 (5 - 19)	
01 January 2019 to 31 December 2019	1565	10 (5 - 20)	26223	701	9 (5 - 16)	8878	864	11 (6 - 26)	17345
MTC average		9 (5 - 18)			9 (5 - 16)			10 (5 - 20)	

All values are median number of days (interquartile range)

Total length of stay, patients with an ISS <= 15



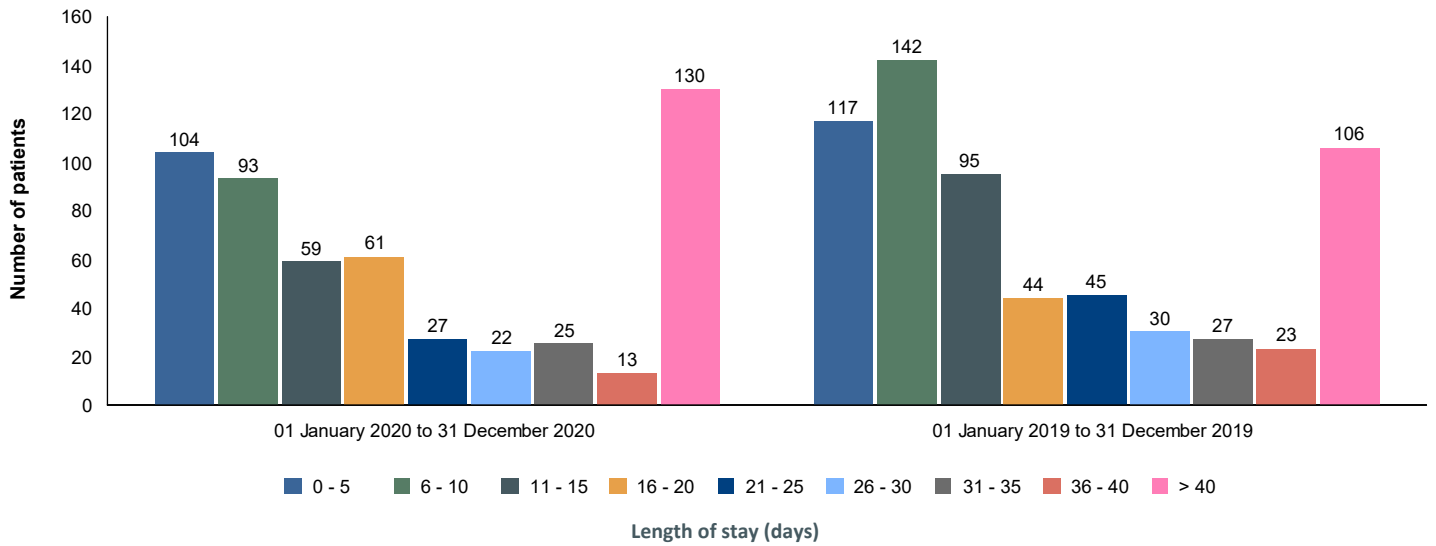
Total length of stay, patients with an ISS > 15



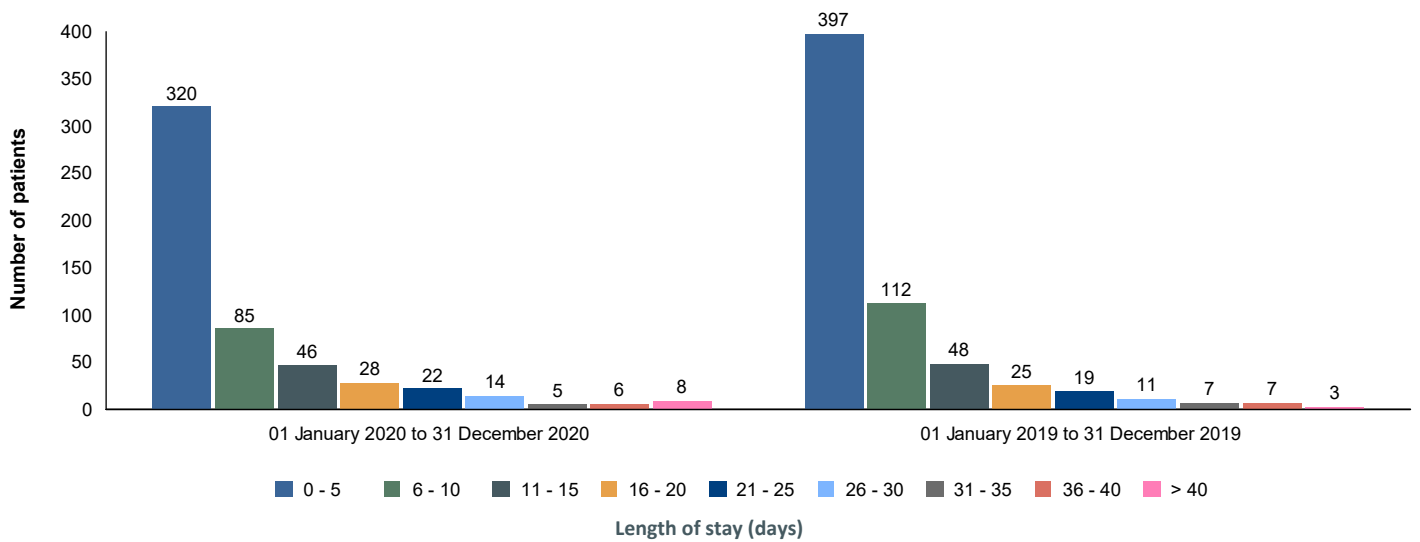
**Example Hospital**  
**Critical Care Information**

Date range	Patients that went to critical care	Median total LOS for critical care patients (days)	Median LOS in critical care (days)	Multiple stays in critical care area*	Multiple stays in critical care area with dates recorded*	Multiple stays in critical care area within 48 hours*
01 January 2020 to 31 December 2020	534	16 (7 - 39)	4 (1 - 10)	38 (7.1%)	2 (0.4%)	0 (0.0%)
MTC average		13 (6 - 27)	3 (1 - 8)	6.6%	4.3%	0.2%
01 January 2019 to 31 December 2019	629	13 (7 - 30)	3 (1 - 9)	29 (4.6%)	0 (0.0%)	N/A
MTC average		14 (6 - 28)	3 (1 - 9)	7.3%	5.1%	0.2%

**Total hospital length of stay for patients that went to critical care**



**Total length of stay in critical care**



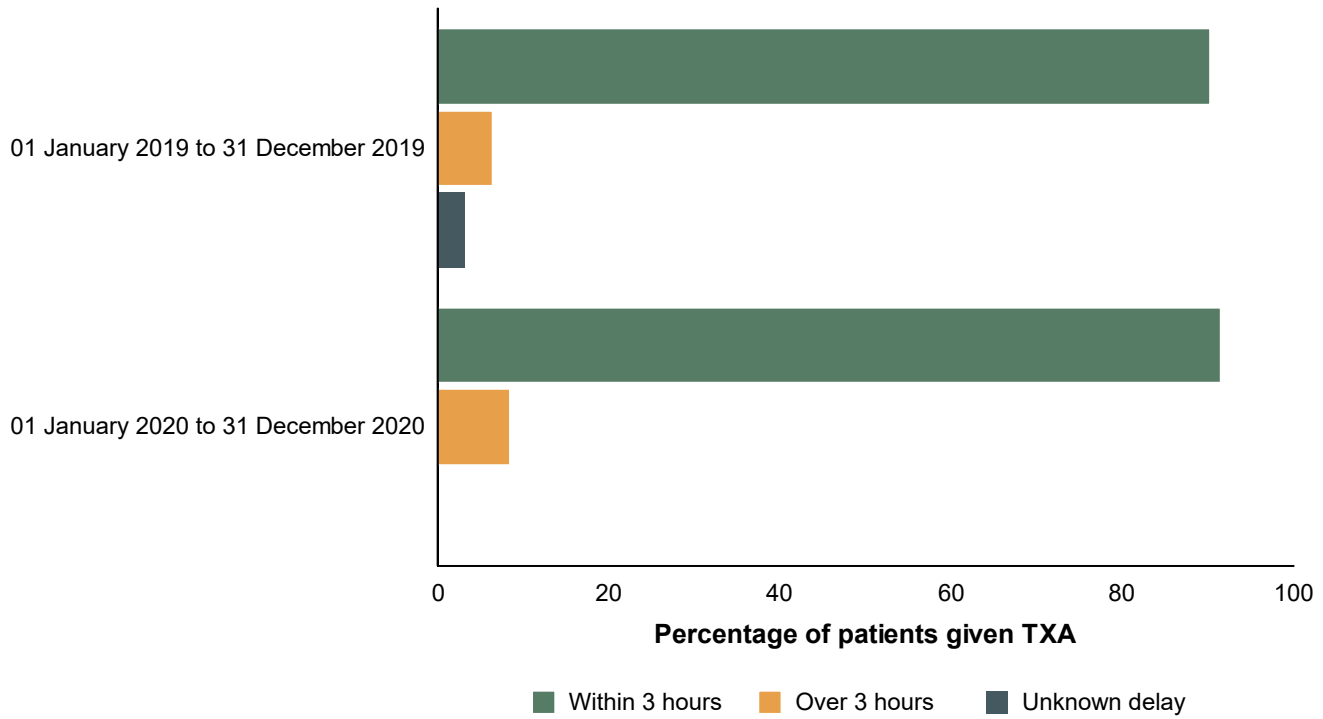
\* Multi stays also includes step downs (i.e. ICU -> HDU) within critical care area

Example Hospital

**Patients receiving Tranexamic Acid**

All patients who receive blood products within 6 hours of the incident.

Date Range	n	Received TXA	TXA within 3 hours of incident	TXA over 3 hours from incident	TXA, unknown delay
01 January 2019 to 31 December 2019	65	62	56 (90.3%)	4 (6.5%)	2 (3.2%)
MTC average			91.7%	5.3%	3%
01 January 2020 to 31 December 2020	64	59	54 (91.5%)	5 (8.5%)	0 (0.0%)
MTC average			89.2%	8.2%	2.6%





## NICE Quality Standards

Figures in blue represent the MTC average

### 1: Airway Management

**Rapid sequence induction (RSI) of anaesthesia and intubation within 45 minutes of the initial call to the emergency services.**

n	Definitive airway	At scene	ED	Recorded within 45 minutes of initial call
<b>Direct admissions, 01 January 2020 to 31 December 2020</b>				
101	89 (88.1%)	79 (78.2%)	10 (9.9%)	0 (0.0%)
	77.5%	43.3%	34.2%	1.5%
<b>Direct admissions, 01 January 2019 to 31 December 2019</b>				
93	87 (93.5%)	75 (80.6%)	12 (12.9%)	0 (0.0%)
	80.4%	44.3%	36.1%	2.4%

Definitive airway management is defined as the management of an airway using intubation, tracheostomy or cricothyroidotomy. Patient are eligible for this standard if they have a GCS < 9 pre-hospital or in the ED.

### 2: Imaging

**People who have had urgent 3D imaging for major trauma have a provisional written radiology report within 60 minutes of the scan.**

Number of patients undergoing 3D imaging	Provisional written report within 60 minutes
<b>Direct admissions, 01 January 2020 to 31 December 2020</b>	
552	526 (95.3%)
	88.1%
<b>Direct admissions, 01 January 2019 to 31 December 2019</b>	
564	514 (91.1%)
	90.2%

Patients are eligible for this standard when they have undergone urgent 3D imaging (CT or MRI within 4 hours of arrival). People who have had urgent 3D imaging for major trauma have a provisional written radiology report within 60 minutes of the scan.

### 3: Fixation & soft tissue cover of open long bone fractures

**People with open fractures of long bones have fixation and definitive soft tissue cover within 72 hours of injury**

n	Stabilisation & fixation	Definitive soft tissue cover	Stabilisation, fixation & definitive soft tissue cover
<b>Direct admissions, 01 January 2020 to 31 December 2020</b>			
125	115 (92.0%)	53 (42.4%)	53 (42.4%)
	79.4%	45.3%	43.2%
<b>Direct admissions, 01 January 2019 to 31 December 2019</b>			
131	119 (90.8%)	35 (26.7%)	35 (26.7%)
	79.4%	45.3%	43.2%

Patients are eligible for this standard when they have suffered from open fractures of the femur, tibia, fibula, humerus, radius & ulna



# TARN

THE TRAUMA AUDIT & RESEARCH NETWORK

## Section II

Patients with Thoracic Injuries

Patients with Abdominal Injuries

Patients with 3+ Rib Fractures

Patients in Shock

Example Hospital  
**Thoracic Injuries - Summary Information**

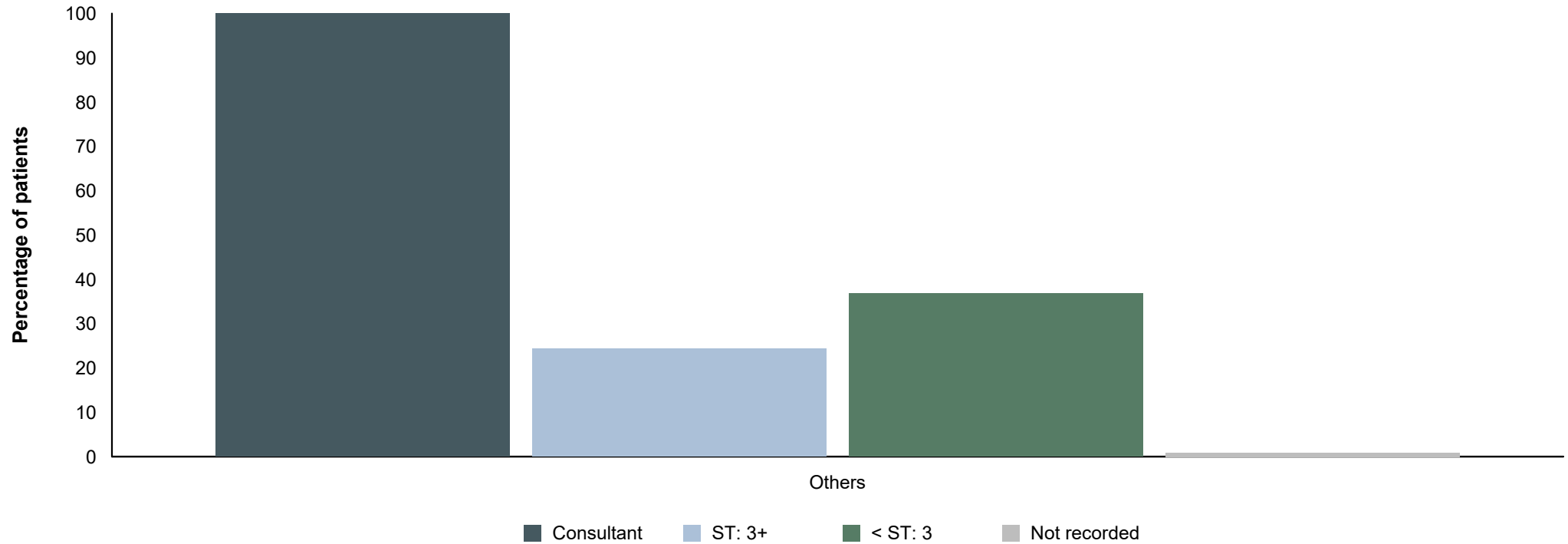
	Children (0 - 15)		Adults		Total
	Blunt	Penetrating	Blunt	Penetrating	
<b>01 January 2020 to 31 December 2020</b>					
Thoracic Injuries - All Severities					
Direct Admissions	4	0	293	8	305
Transfers In	5	0	126	6	137
Thoracic Injuries - AIS 3+					
Direct Admissions	4	0	245	8	257
Transfers In	5	0	104	6	115
<b>01 January 2019 to 31 December 2019</b>					
Thoracic Injuries - All Severities					
Direct Admissions	5	1	297	6	309
Transfers In	13	1	140	9	163
Thoracic Injuries - AIS 3+					
Direct Admissions	5	1	227	6	239
Transfers In	11	1	118	9	139

Example Hospital

**Most senior doctor seeing patients with AIS 3+ thoracic injuries in the Emergency Department**

Patients directly admitted, all specialities

Category	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
<b>01 January 2020 to 31 December 2020</b>						
Isolated Thoracic Injuries	116	76 (65.5%)	65.8%	17 (14.7%)	22 (19.0%)	1 (0.9%)
Non-Isolated Thoracic Injuries	141	133 (94.3%)	89.4%	4 (2.8%)	4 (2.8%)	0 (0.0%)
<b>01 January 2019 to 31 December 2019</b>						
Isolated Thoracic Injuries	113	92 (81.4%)	70.8%	5 (4.4%)	16 (14.2%)	0 (0.0%)
Non-Isolated Thoracic Injuries	126	122 (96.8%)	92%	3 (2.4%)	1 (0.8%)	0 (0.0%)



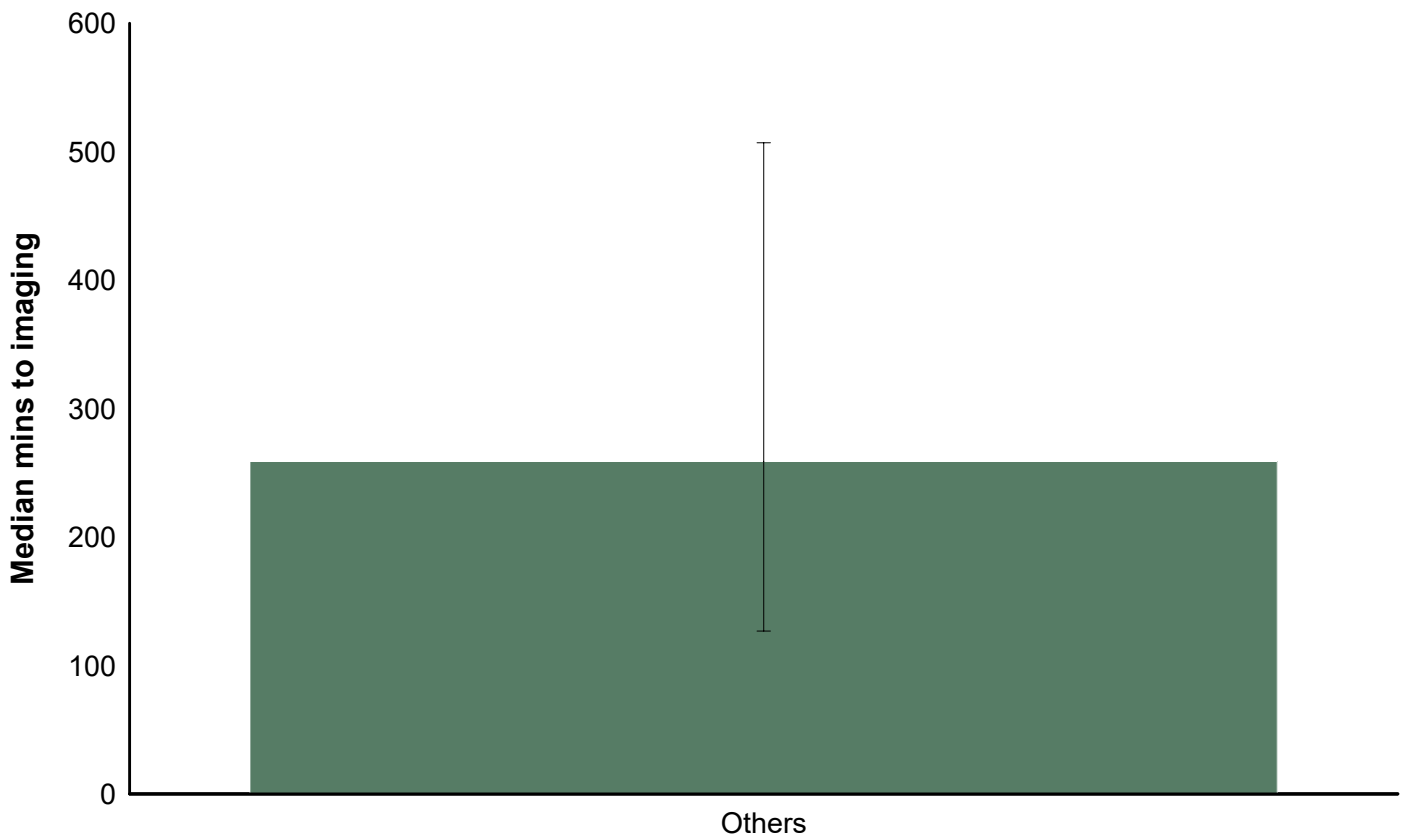
Example Hospital

Time to CT or MRI scan, patients with AIS3+ thoracic injuries

Direct Admissions

(excluding patients with a time difference greater than 24 hours or taken directly to theatre)

Category	n	Imaging recorded	Imaging with date & time	Mins to imaging* Median (IQR)	MTC mins to imaging Median (IQR)
<b>01 January 2020 to 31 December 2020</b>					
Isolated Thoracic Injuries	104	104	103	97 (42 - 187)	60 (29 - 155)
Non-Isolated Thoracic Injuries	133	133	133	41 (29 - 59)	30 (20 - 47)
<b>01 January 2019 to 31 December 2019</b>					
Isolated Thoracic Injuries	100	100	100	88 (29 - 215)	48 (25 - 167)
Non-Isolated Thoracic Injuries	120	120	120	33 (27 - 46)	27 (19 - 41)



\* N/A means there are not enough cases to calculate the median / IQR

Example Hospital  
**Abdominal Injuries - Summary Information**

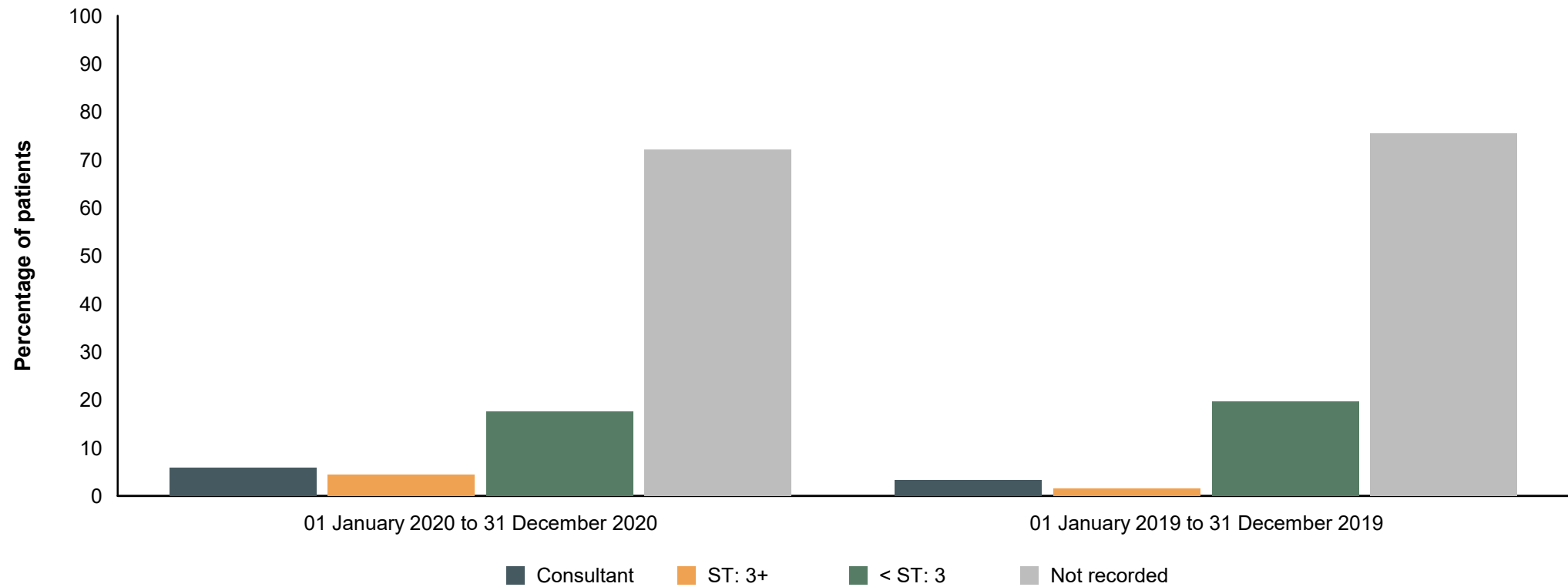
	Children		Adults		Total
	Blunt	Penetrating	Blunt	Penetrating	
<b>01 January 2020 to 31 December 2020</b>					
Abdominal Injuries - All Severities					
Direct Admissions	6	0	94	9	109
Transfers In	13	0	53	6	72
Abdominal Injuries - AIS 3+					
Direct Admissions	4	0	56	8	68
Transfers In	10	0	31	6	47
<b>01 January 2019 to 31 December 2019</b>					
Abdominal Injuries - All Severities					
Direct Admissions	5	1	98	8	112
Transfers In	14	1	60	6	81
Abdominal Injuries - AIS 3+					
Direct Admissions	4	1	49	7	61
Transfers In	12	1	33	6	52

Example Hospital

Presence and grade of general surgeon in the ED for patients with AIS 3+ abdominal injuries

Direct Admissions

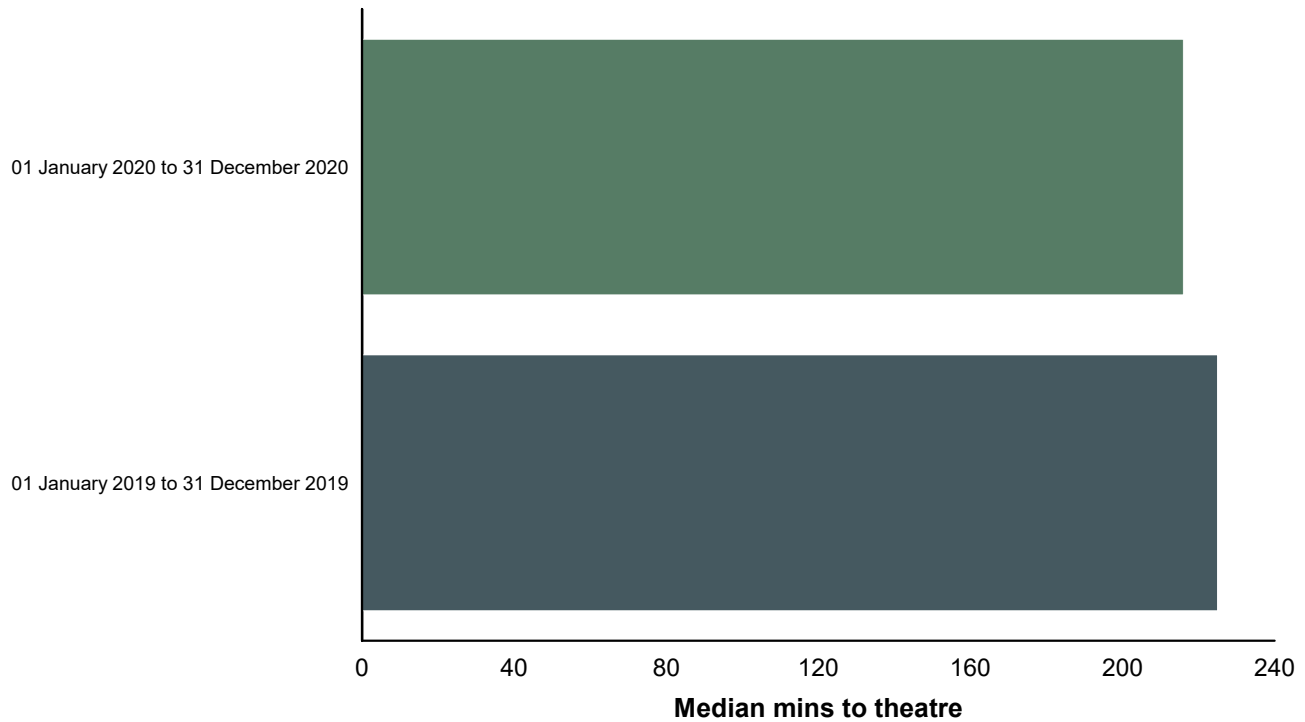
Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
<b>01 January 2020 to 31 December 2020</b>					
68	4 (5.9%)	5.8%	3 (4.4%)	12 (17.6%)	49 (72.1%)
<b>01 January 2019 to 31 December 2019</b>					
61	2 (3.3%)	5.6%	1 (1.6%)	12 (19.7%)	46 (75.4%)



## Example Hospital

**Time to theatre (emergency operations), patients with AIS3+ abdominal injuries****Direct Admissions (excluding patients with a time difference greater than 24 hours)**

Date Range	n	Operation recorded	Mins to theatre* Median (IQR)	MTC mins to theatre Median (IQR)
01 January 2020 to 31 December 2020	68	16	216 (156 - 368)	156 (90 - 294)
01 January 2019 to 31 December 2019	61	24	225 (73 - 460)	156 (85 - 333)



A list of the procedures defined as emergency operations is available from TARN on request.

\* N/A means there are not enough cases to calculate the median and interquartile range

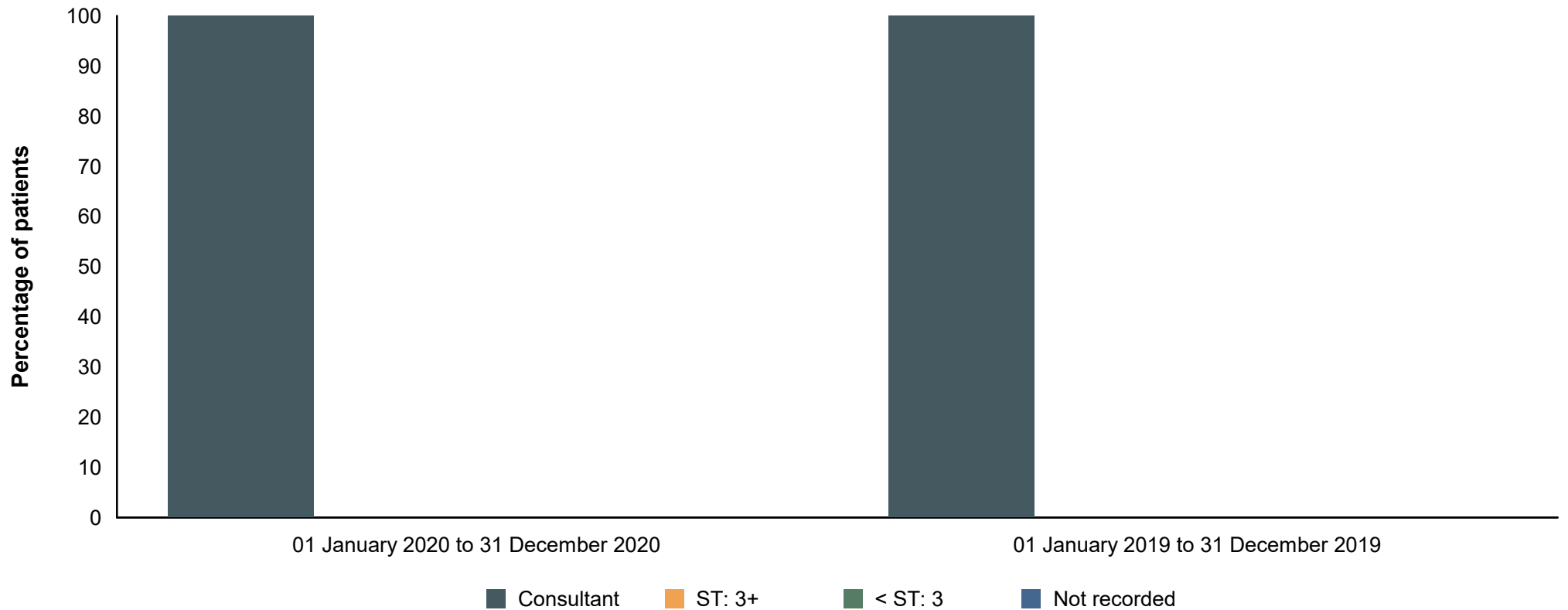


Example Hospital

Grade of Surgeon during the initial operation for patients with AIS 3+ abdominal injuries

Direct Admissions

	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
01 January 2020 to 31 December 2020	16	16 (100.0%)	93.1%	0 (0.0%)	0 (0.0%)	0 (0.0%)
01 January 2019 to 31 December 2019	24	24 (100.0%)	88.9%	0 (0.0%)	0 (0.0%)	0 (0.0%)

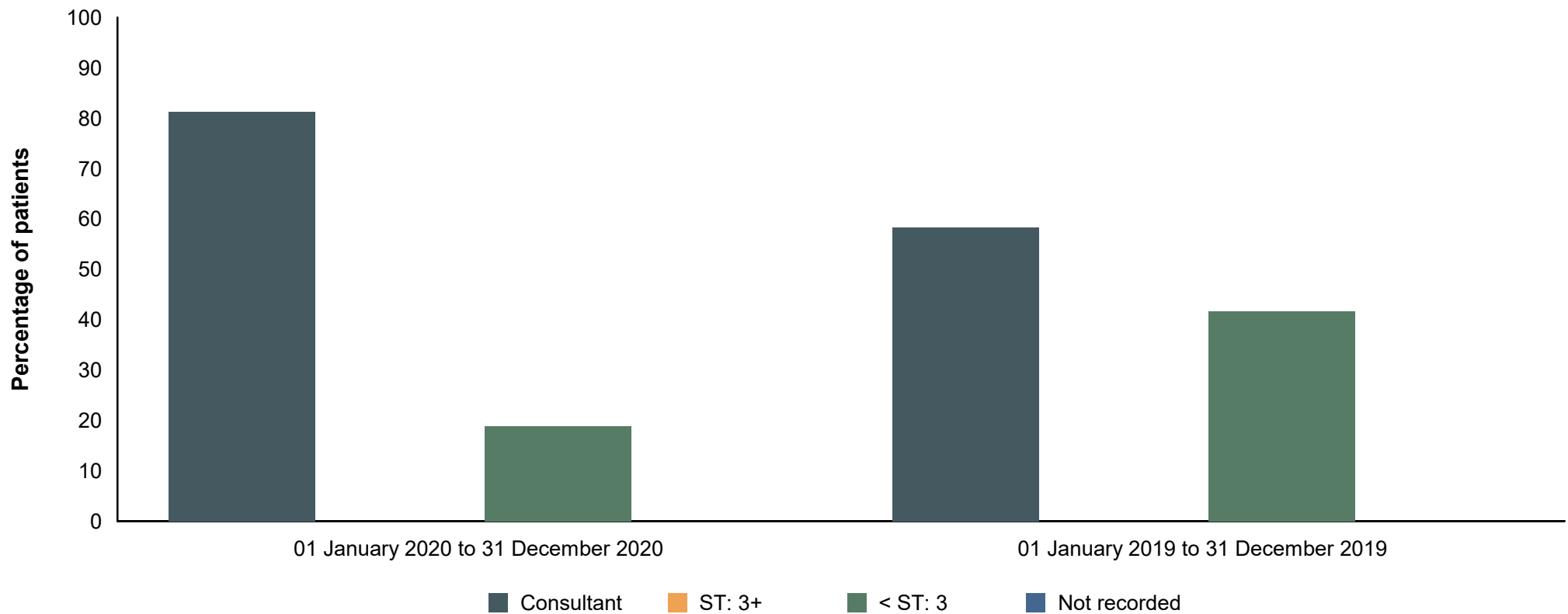


Example Hospital

Grade of Anaesthetist during the initial operation for patients with AIS 3+ abdominal injuries

Direct Admissions

	Total	Consultant	MTC average consultant	ST: 3+	< ST: 3	Not recorded
01 January 2020 to 31 December 2020	16	13 (81.3%)	80.2%	0 (0.0%)	3 (18.8%)	0 (0.0%)
01 January 2019 to 31 December 2019	24	14 (58.3%)	76.6%	0 (0.0%)	10 (41.7%)	0 (0.0%)



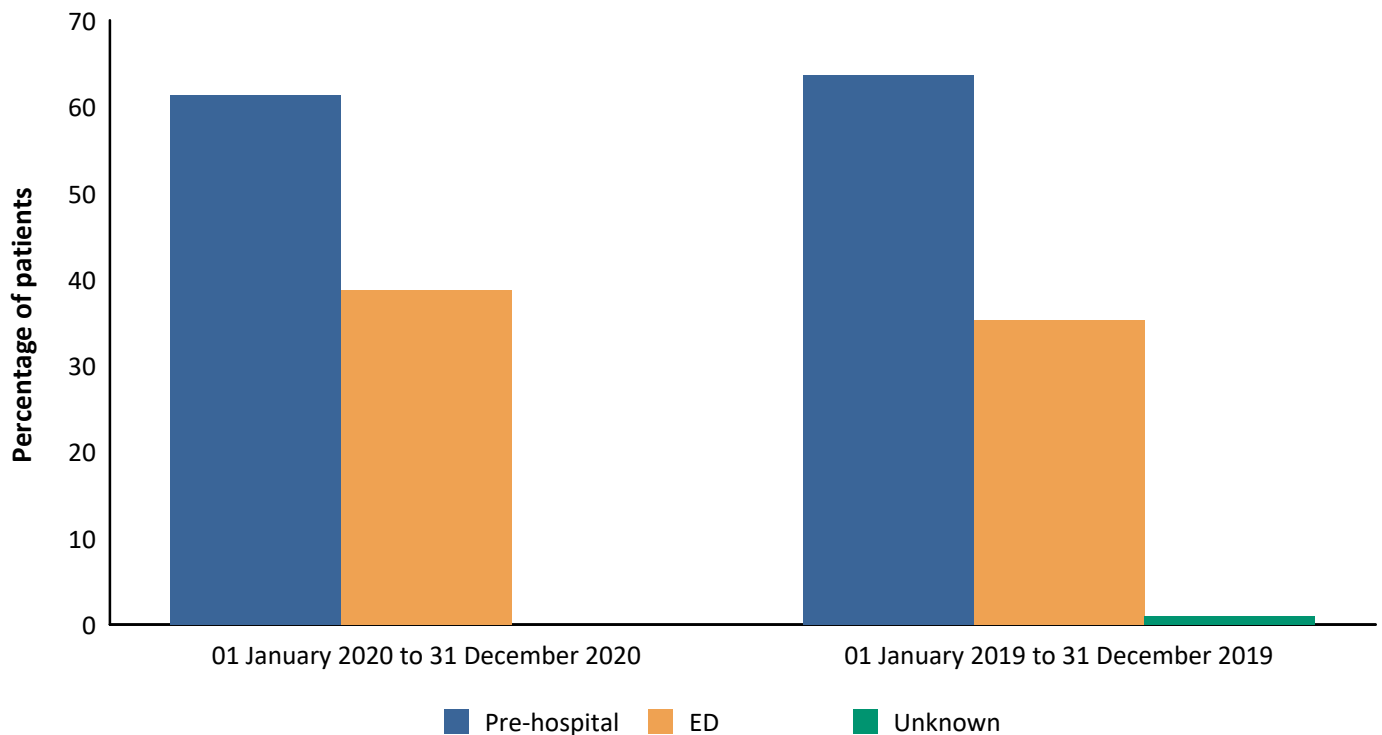
**Example Hospital**  
**Management of chest wall injuries**  
**Patients with 3+ rib fractures**

Date range	Total	Transfers in	Rib fixation	Aged under 65	Aged 65 and over	Given pain relief*	Median LOS (IQR)	Median LOS CC (IQR)
01 January 2020 to 31 December 2020	264	74 (28%)	1 (0.4%)	142 (53.8%)	122 (46.2%)	93 (35.2%)	11 (6 - 23)	4 (2 - 10)
<b>MTC average</b>		21.4%	4.6%	50.4%	49.6%	28.3%	9 (5 - 17)	4 (2 - 10)
01 January 2019 to 31 December 2019	240	76 (31.7%)	0 (0%)	140 (58.3%)	100 (41.7%)	102 (42.5%)	12 (7 - 27)	4 (2 - 9)
<b>MTC average</b>		21.8%	6%	52%	48%	25.3%	10 (5 - 18)	4 (2 - 10)

**Patients with 3+ rib fractures given pain relief**

Date range	Total	Pain relief location			Minutes to pain relief Median (IQR)**
		Pre-hospital	ED	Unknown	
01 January 2020 to 31 December 2020	93	57 (61.3%)	36 (38.7%)	0 (0%)	106 (62 - 262)
<b>MTC average</b>		27.5%	65.9%	6.7%	226 (90 - 443)
01 January 2019 to 31 December 2019	102	65 (63.7%)	36 (35.3%)	1 (1%)	82 (57 - 259)
<b>MTC average</b>		27.4%	66.5%	6.1%	234 (85 - 414)

**Location pain relief was administered**



\* Pain relief includes the following analgesia types:

Local anaesthetic patches, Local anaesthetic blockade (non epidural/paravertebral), Epidural block, Paravertebral block, Other

\*\* Excluding patients with a time difference greater than 24 hours

## Management of shocked\* patients

### \*Adults with SBP < 110 pre-hospital or in the ED & a blunt injury mechanism

Date Range	Transfer Type	n	Died
01 January 2020 to 31 December 2020	Direct Admissions	191	26 (13.6%)
	Transfers In	39	7 (17.9%)
01 January 2019 to 31 December 2019	Direct Admissions	202	30 (14.9%)
	Transfers In	47	7 (14.9%)

### Direct Admissions

#### 01 January 2020 to 31 December 2020

##### Grade of most senior doctor performing the initial operation on shocked patients

Category	Consultant	ST: 3+	< ST: 3+	Not recorded
Grade of Surgeon	105 (93.8%)	0 (0.0%)	7 (6.3%)	0 (0.0%)
Grade of Anaesthetist	86 (76.8%)	1 (0.9%)	18 (16.1%)	7 (6.3%)

79 of the 191 patients directly admitted had no operation recorded.

#### 01 January 2019 to 31 December 2019

##### Grade of most senior doctor performing the initial operation on shocked patients

Category	Consultant	ST: 3+	< ST: 3+	Not recorded
Grade of Surgeon	114 (94.2%)	1 (0.8%)	6 (5.0%)	0 (0.0%)
Grade of Anaesthetist	91 (75.2%)	1 (0.8%)	27 (22.3%)	2 (1.7%)

81 of the 202 patients directly admitted had no operation recorded.

The appendix for this report is a separate Excel file, below are details of which filters to apply in order to select patients relevant to each page.

Please request your appendix by emailing [support@tarn.ac.uk](mailto:support@tarn.ac.uk).

Page	Filter(s) to apply
Pre-hospital care	Direct admission = Yes
Most senior doctor (5 / 30 minutes & ED)	Direct admission = Yes ISS > 15 / Trauma Team = Yes or No for categories
Time to CT scan	Direct admission = Yes Head 3+ = Yes / NICE = Yes for categories
Time to CT scan by month	Direct admission = Yes, Month is based on arrival date
Time to Operation	Direct admission = Yes Head 3+ = Yes for category
Critical care information	ICU LOS > 0
Most senior doctor, AIS 3+ thoracic injuries	Direct admission = Yes, Thoracic injury severity >= 3
Time to CT or MRI scan, AIS 3+ thoracic injuries	Direct admission = Yes, Thoracic injury severity >= 3
Grade of ED general surgeon, AIS 3+ abdominal injuries	Direct admission = Yes, Abdominal injury severity >= 3
Time to theatre, AIS 3+ abdominal injuries	Direct admission = Yes, Abdominal injury severity >= 3
Surgeon / anaesthetist grade, AIS 3+ abdominal injuries	Direct admission = Yes, Abdominal injury severity >= 3
Management of shocked patients	Shocked = Yes, Direct admission = Yes for subsection
Patients receiving tranexamic acid	Blood within 6h = Yes