London Ambulance Service
NHS Trust

Cardiac Arrest Annual Report

April 2024 – March 2025

October 2025

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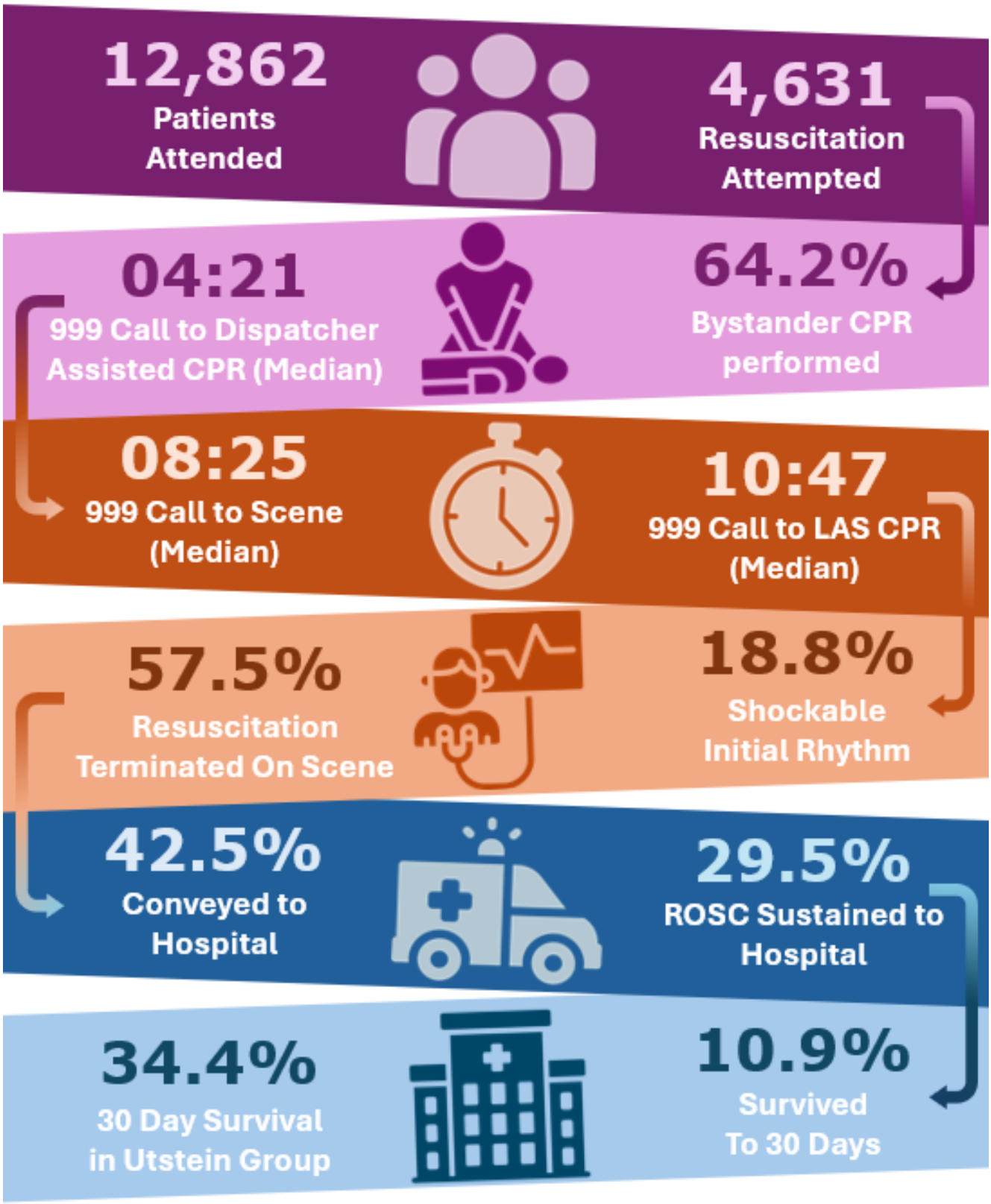

1. Introduction

From 1 April 2024 to 31 March 2025, London Ambulance Service NHS Trust (LAS) clinicians attended **12,862 patients** who experienced an out-of-hospital cardiac arrest (OHCA) in the Greater London area. This report provides key information on the demographics of these patients, the pre-hospital care they received, and their outcomes.

The information presented in this report was sourced from the LAS Cardiac Arrest Registry maintained by the Clinical Audit and Research Unit (CARU). The registry compiles clinical and operational data derived from patient clinical records, Emergency Operations Centre (EOC) call logs, the GoodSam application, and the national Patient Demographics Service.

Data were collected and are reported in accordance with the internationally recognised Utstein guidelines (1). Average times are reported as means and medians to account for skewed data. All data were correct at the time of the publication.

2. All Cardiac Arrests Attended (n=12,862)

2.1. Demographics

Sex, n (%) *	
Male	7,890 (61.3)
Female	4,917 (38.2)
Unknown	55 (0.4)

Age, mean (median) in years †	
Overall	70 (73)
Male	67 (69)
Female	74 (79)

Location, n (%) ~	
Private location	11,334 (88.1)
Private address	*10,625 (82.6)*
Care home	*709 (5.5)*
Public location	1,522 (11.8)

Ethnic group, n (%)	
White	5,451 (42.4)
Asian	599 (4.7)
Black	580 (4.5)
Other	172 (1.3)
Mixed	117 (0.9)
Unknown	5,943 (46.2)

Chief complaint at call handling, n (%)	
Cardiac arrest	7,858 (61.1)
Breathing problems	621 (4.8)
Unconscious/fainting	565 (4.4)
NHS 111 Transfer	478 (3.7)
Falls	264 (2.1)
Convulsions/fitting	149 (1.2)
Chest pain	120 (0.9)
Other ‡	2,807 (21.8)

Table 1: Profile of patients attended in 2024/25

†Excludes patients with unknown age (n=67). ~ Excludes unknown location (n=6). ‡ Includes healthcare professional admissions (n=95). N.B. Percentages may not total 100% due to rounding

- The mean age of the cardiac arrest patient was **70 years**.
- More patients were **male** (**61.3%)** who were, on average, 7 years younger than females.
- '**White'** was the most frequently documented ethnic group, but nearly half of all ethnicities were unknown or not reported.
- Most OHCAs occurred at a **private location** (**88.1%**, n=11,334).
- **61.1%** of **cardiac arrests** were **identified** as such during call handling.

2.2. Time of cardiac arrest

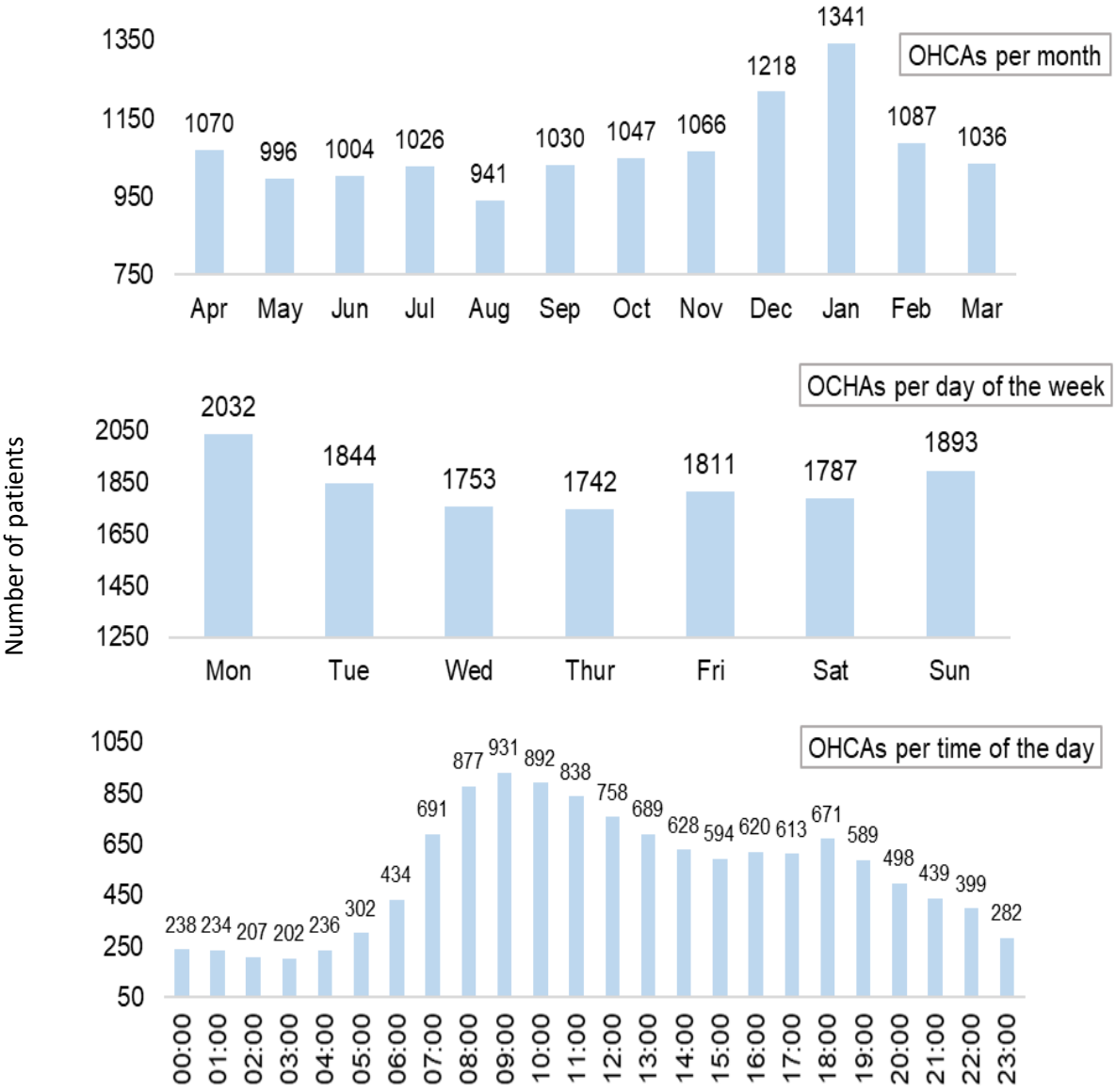

Figure 1: Occurrence of all cardiac arrests

- OHCAs occurred more frequently in **January** (10.4%, n=1,341) and on a **Monday** (15.8%, n=2,032), with the call for help most commonly being received between **9:00 - 09:59** in the morning (7.2%, n=931).

2.3. Resuscitative efforts

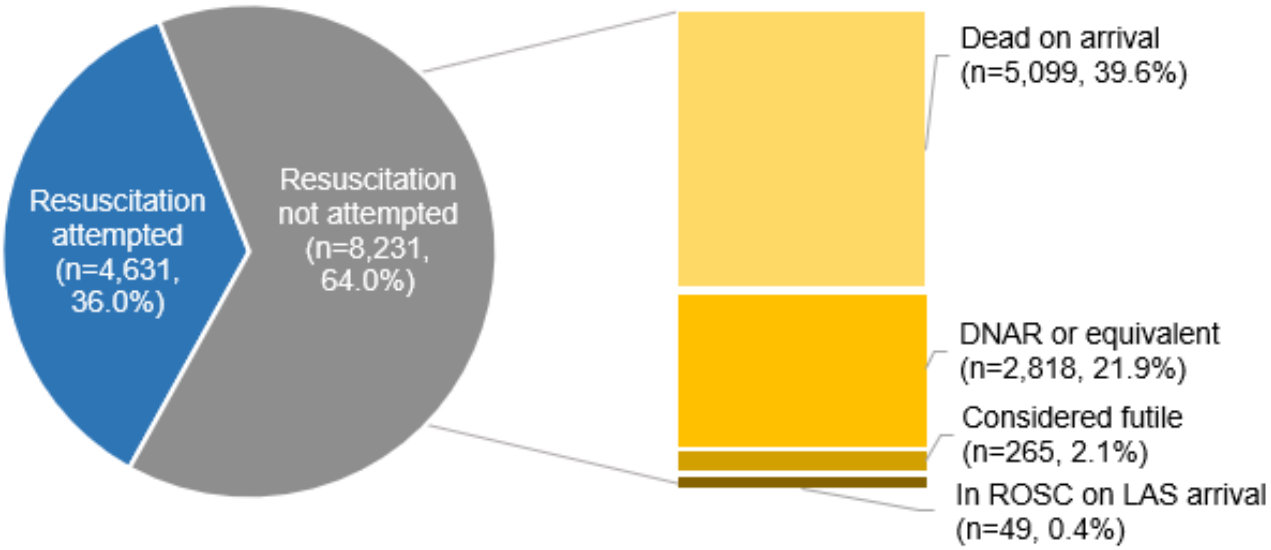

Figure 2: Resuscitative efforts with a breakdown of reasons for non-resuscitation

- **Resuscitation was attempted** by LAS clinicians for **36%** of patients in cardiac arrest (n=4,631).
- The most common reason for resuscitation not being undertaken was that the patient was already dead upon LAS arrival or there was a Do Not Attempt Resuscitation (DNAR) order or equivalent in place.
- 49 patients were reported to have received defibrillator shocks and achieved a return of spontaneous circulation (ROSC) prior to LAS arrival. These patients did not require further resuscitation from LAS clinicians. Further information about this patient group is available in Appendix 1.

2.4. Pre-arrival interventions

2.4.1. Dispatcher assisted CPR

Dispatcher-assisted CPR instructions were provided to the caller in 4,791 cases. It is important to recognise that not all callers will accept CPR guidance. In addition, in some circumstances, such as in cases involving an obvious or expected death, offering CPR instructions may not be appropriate.

The time to delivery of these instructions is presented below.

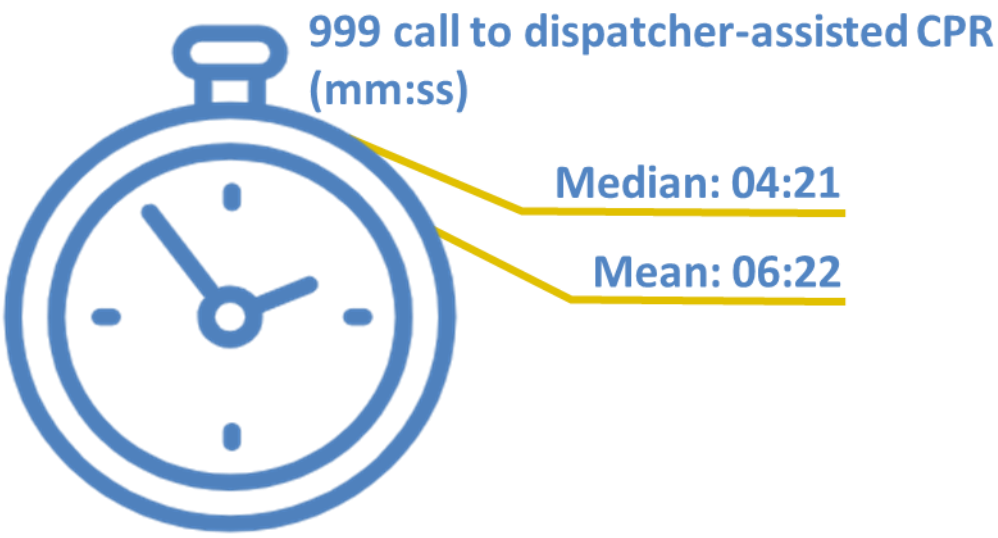

Figure 3: Average time from 999 call to the initiation of dispatcher-assisted CPR

- The **median time** from receiving the 999 call to delivery of dispatcher-assisted CPR instructions was **4 minutes and 21 seconds**, which is consistent with last year's figure (4 minutes and 29 seconds).

2.4.2. GoodSam responders

GoodSam (https://www.goodsamapp.org/) is a mobile application that automatically notifies trained volunteer responders of nearby cardiac arrest incidents.

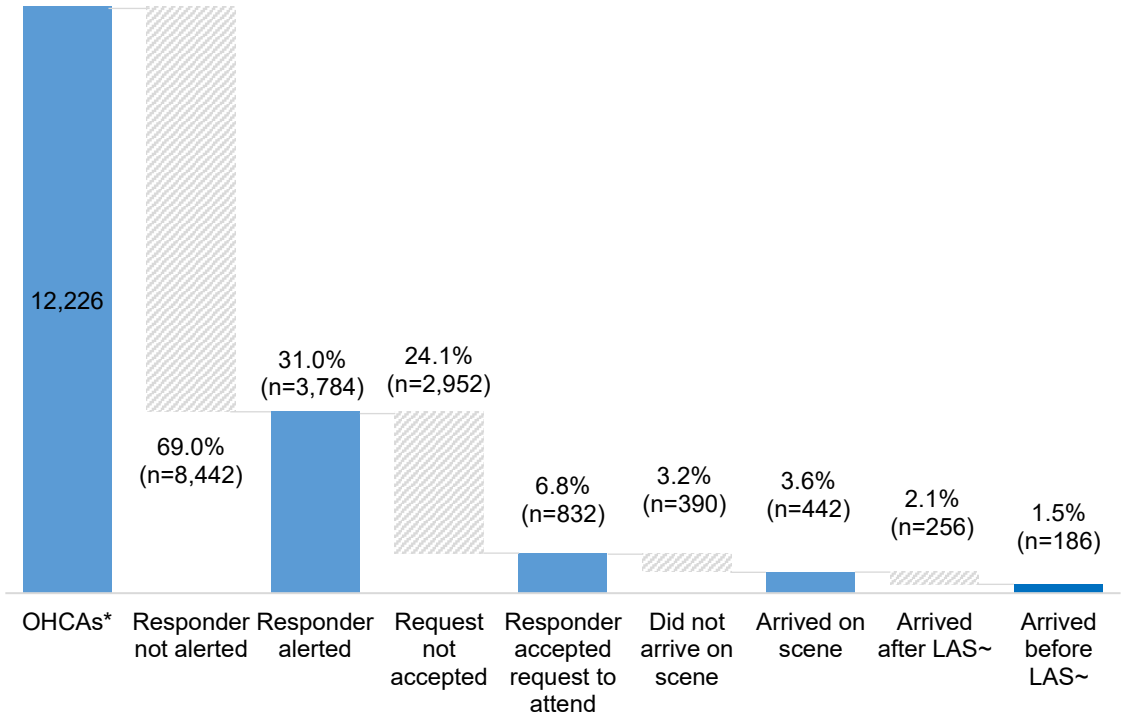

Figure 4: GoodSam responders – from alert to arrival at scene

**Excludes LAS witnessed cardiac arrests. ~ Based 'arrival at scene time' recorded in the GoodSam application*

- GoodSam responders were **alerted** to **31.0%** (n=3,784) of OHCAs in London. This represents a continued upward trend from previous years: 23.7% in 2021/22, 28.4% in 2022/23 and 29.3% in 2023/24.
- **22.0%** of the alerts (n=832/3,784) were **accepted** by volunteers, closely matching last year's response rate of 22.4%.
- When an alert was accepted, more than half (**53.1%**, n=442/832) of responders **arrived** at scene, with **42.1%** (n=186/442) of these arriving **before** the LAS.

3. Where Resuscitation Was Attempted (n=4,631)

This section outlines demographic information and details of the care provided to the 4,631 patients in London who received a resuscitation attempt by LAS clinicians.

3.1. Patient profile

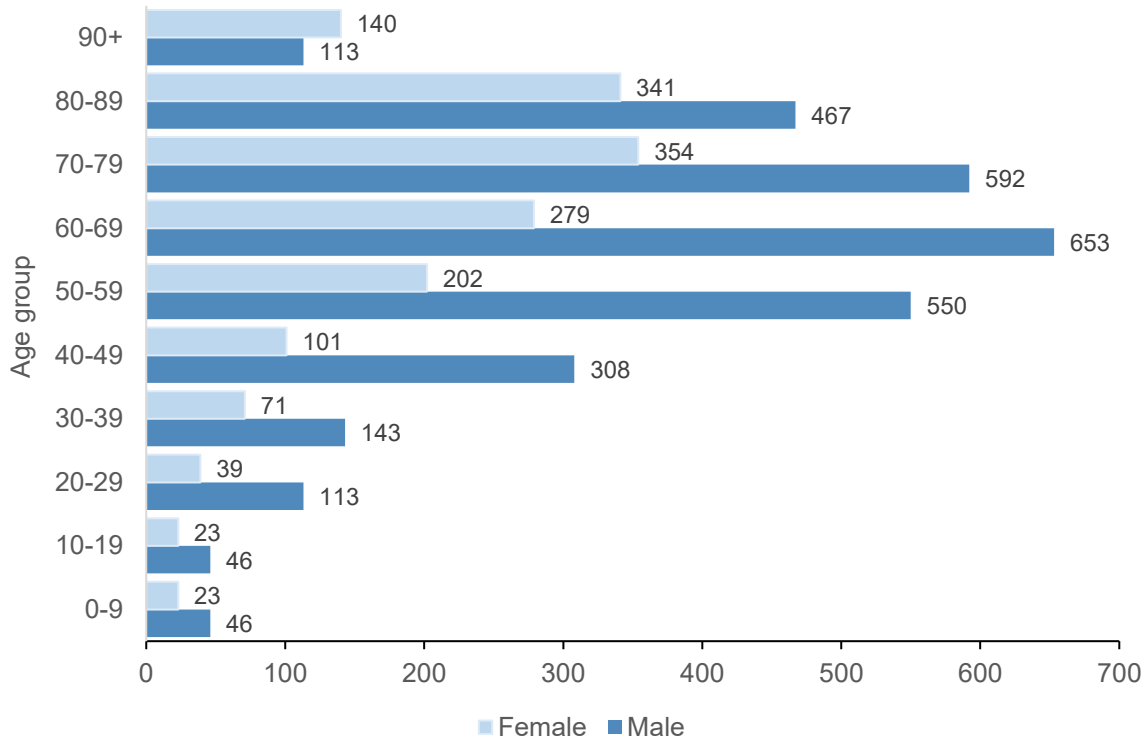

Figure 5: Age distribution by sex for patients who had resuscitation attempted

Excludes patients with missing age and sex information (n=27)

- The average age of patients who received resuscitative efforts from LAS clinicians was **64 years** (median age: 67).
- Where documented, almost two thirds of patients were **male** (**65.9%**, n=3,043).
- The age distribution for **males** was skewed towards **younger** ages compared to females (mean of 64 and 68 years respectively), with a peak between 60-69 for males and 70-79 for females.

3.2. Location of arrest

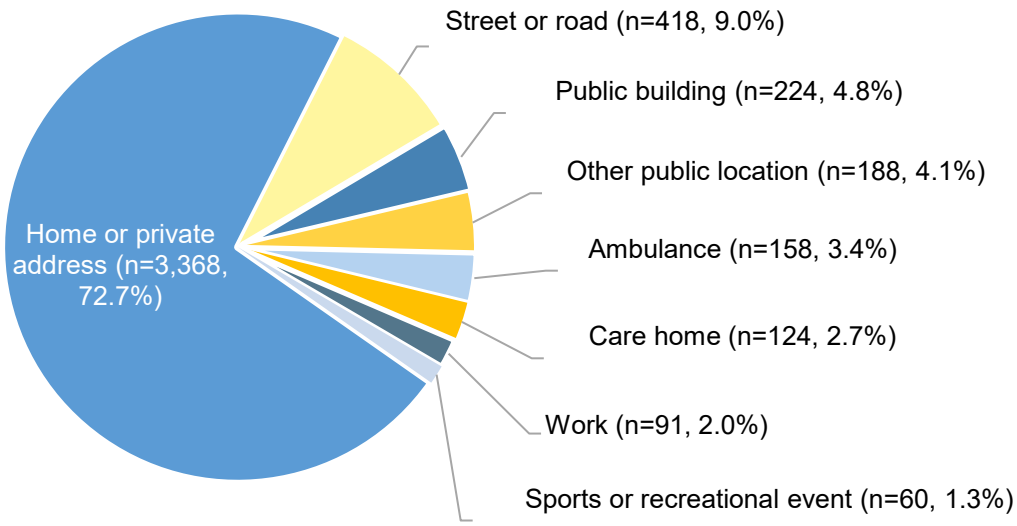

Figure 6: Location of cardiac arrest where resuscitation was attempted

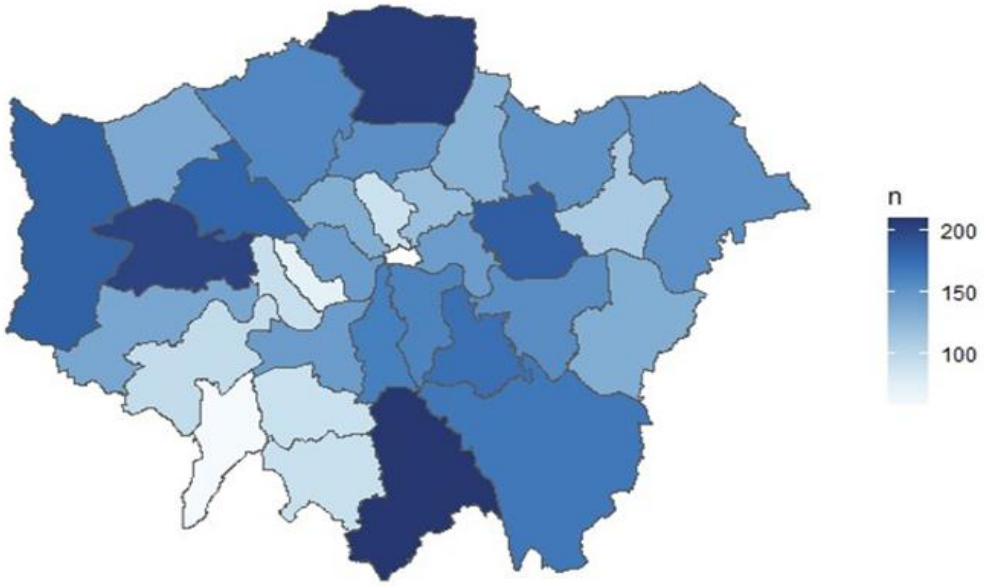

Figure 7: Incidence of cardiac arrest by local authority

Excludes incidents with no location reported (n=94) and City of London due to low numbers (n=13)

- As with all OHCAs across London, the most common location of arrest, for patients who subsequently had resuscitation undertaken by LAS, was a **private** residential location (**72.7%**).
- There was large variation in incidence across London which likely reflects different population demographics and numbers between the areas.

3.3. Time of cardiac arrest

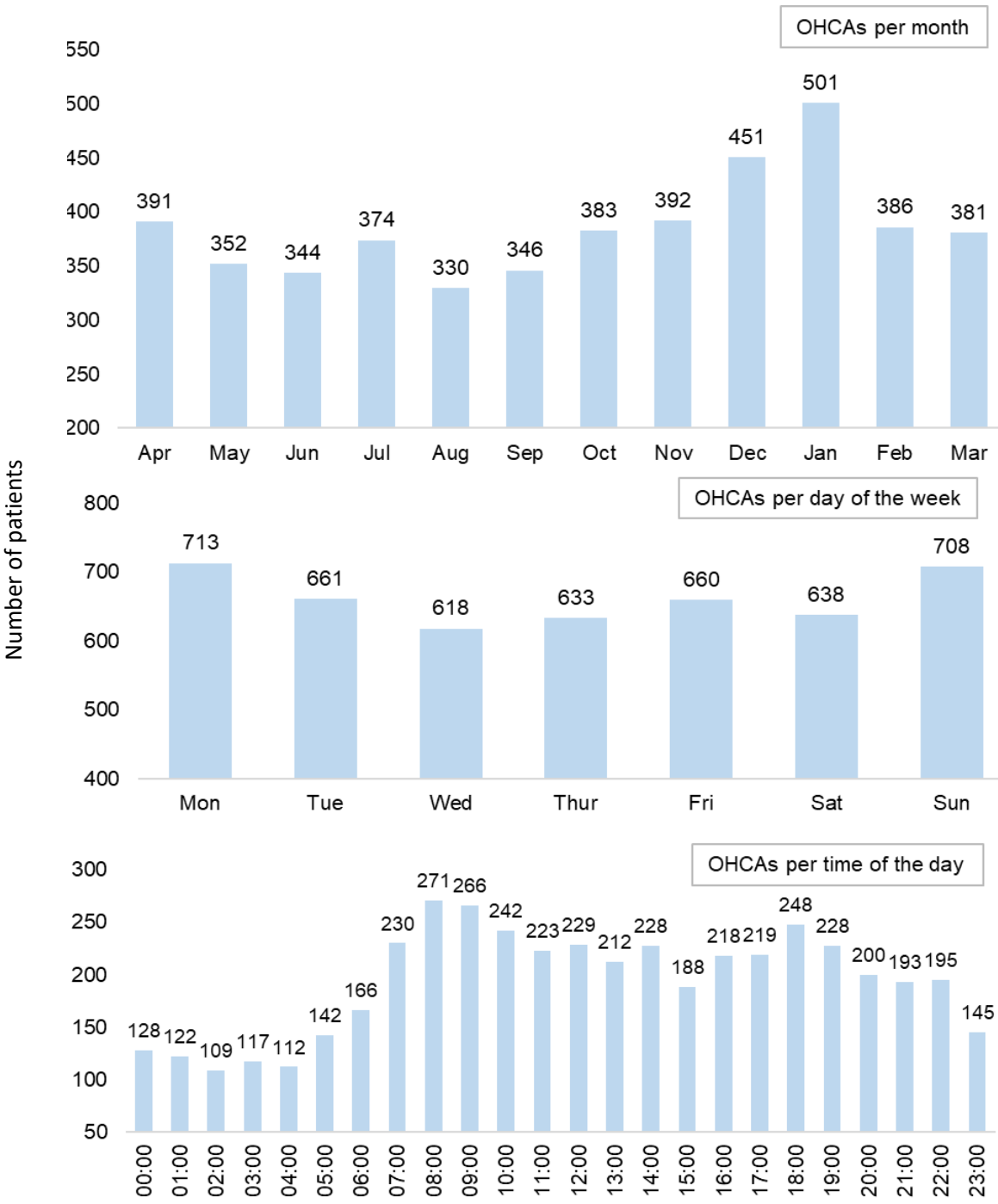

Figure 8: Occurrence of cardiac arrests (resuscitation attempted)

- As with all arrests, OHCAs where resuscitation was attempted occurred more frequently in **January** and on a **Monday**, but the call volume reached its peak **between 08:00 - 08:55** (just slightly higher than 09:00 - 09:59).

3.4. Witness status

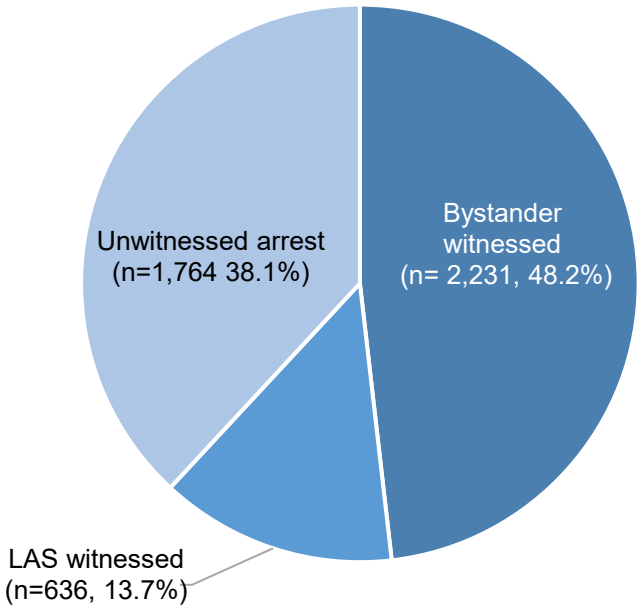

Figure 9: Witness status of cardiac arrest patients

- Almost half of OHCAs, where LAS clinicians attempted resuscitation, were **witnessed by a bystander** (**48.2%**, n=2,231).
- **13.7%** of arrests (n=636) were **witnessed by LAS** clinicians.

3.5. Bystander interventions

This section provides information on the rates of bystander CPR and bystander use of an Automated External Defibrillator (AED). A bystander is a person who is on scene, or alerted to the scene, but is not dispatched as part of an organised emergency response system. LAS witnessed arrests are excluded from all figures. Outcomes associated with these interventions can be found in Appendix 2.

3.5.1. Bystander CPR

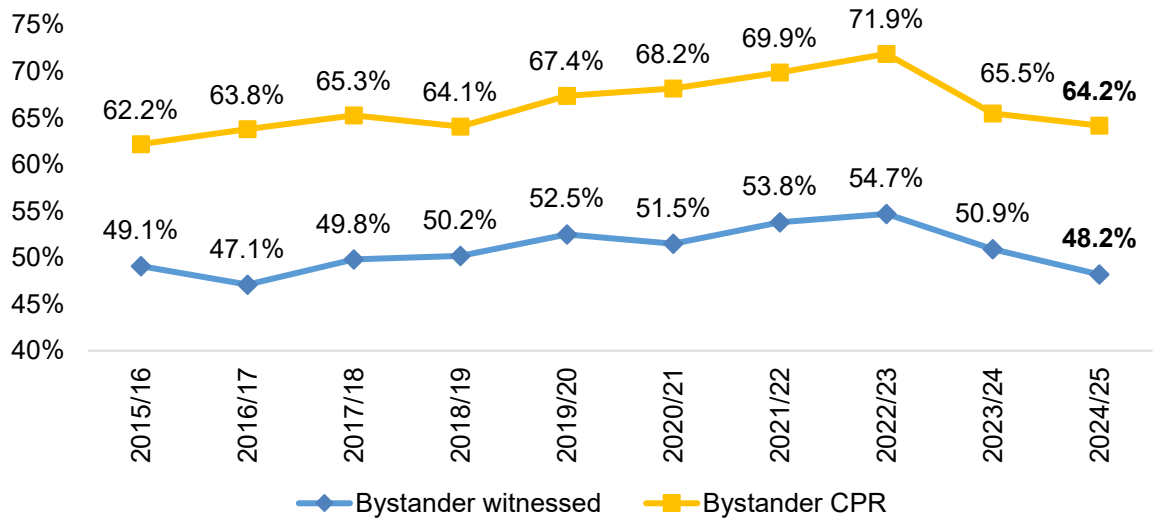

Figure 10: Bystander witnessed* and bystander CPR rates by year

**Includes all cardiac arrests where resuscitation was attempted*

- **64.2%** of patients received **bystander CPR** reflecting a **continued decline** from the peak of 71.9% in 2022/23, mirroring a parallel reduction in the proportion of witnessed cardiac arrests.
- **Bystander CPR provision** was notably **higher** when the arrest was bystander **witnessed** rather than unwitnessed (**68.5%** vs 58.7%).

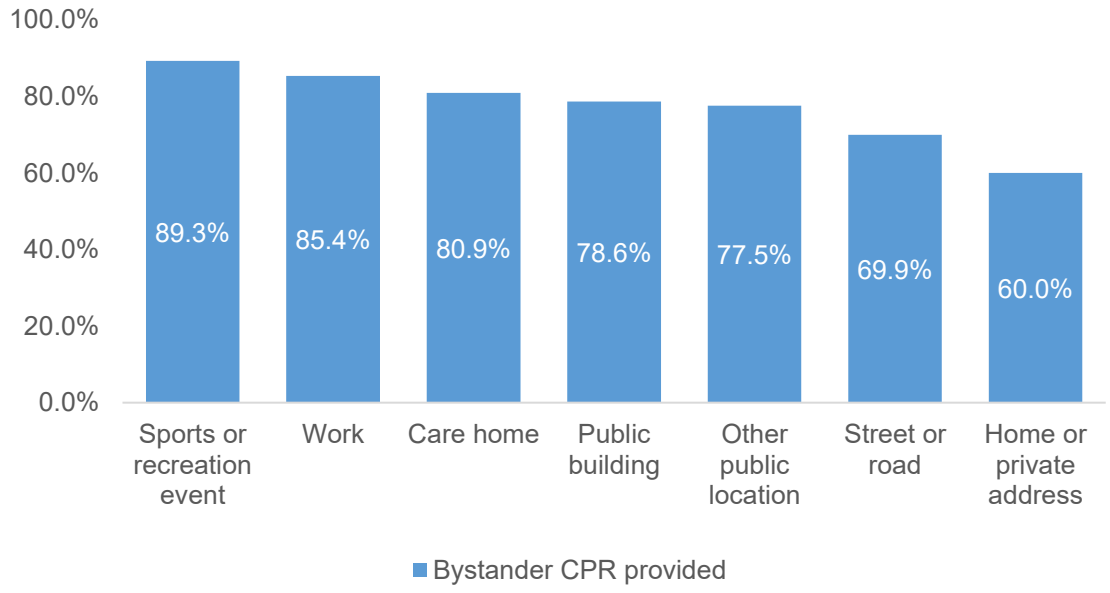

Figure 11: Bystander CPR by location

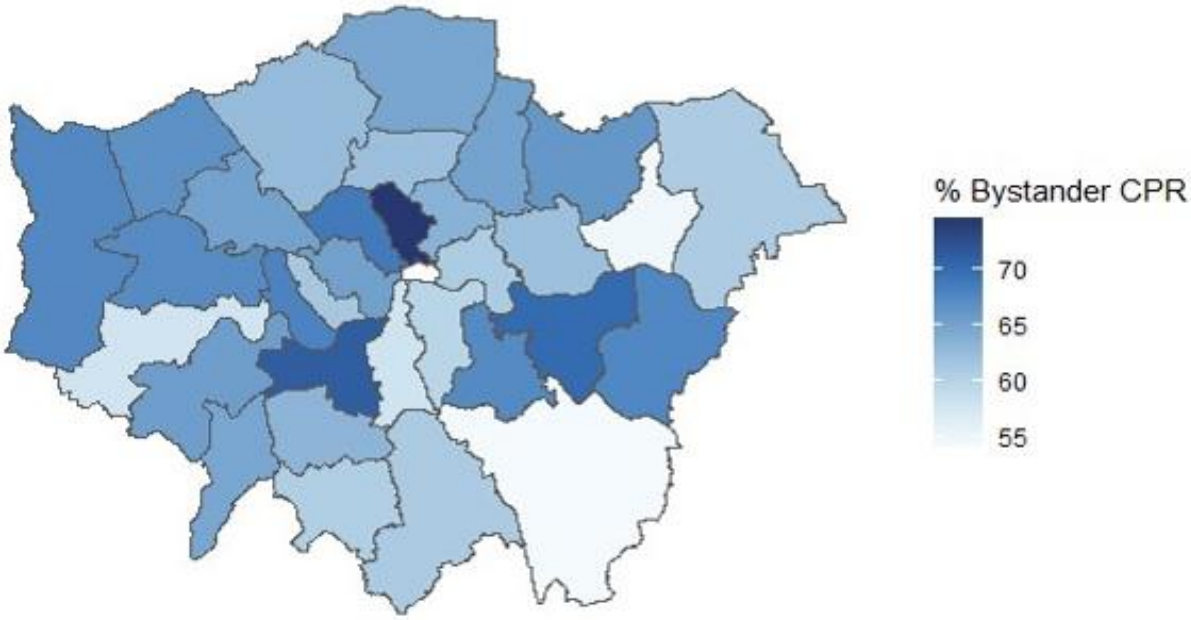

Figure 12: Bystander CPR broken down by local authority

Excludes incidents with no location reported (n=85) and City of London due to low numbers (n=13)

- Bystander CPR was more common at a **sports or recreational event** (89.3%), closely followed by a place of **work** (85.4%).
- There was large variation in bystander CPR rates across the Greater London, with the **highest proportion** in the **Islington** local authority district (74.4%).

3.5.2. Bystander defibrillation

This section reports on defibrillator use by bystanders for patients that had resuscitation continued by LAS. The term 'deployed' refers to when a defibrillator was brought, and attached, to the patient before LAS clinicians arrived on scene.

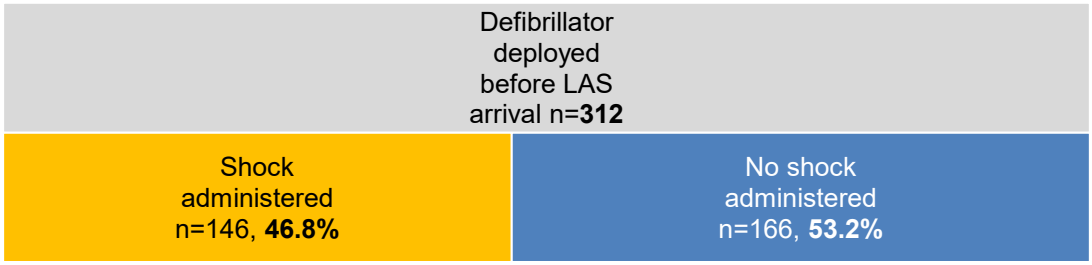

Figure 13: Bystander defibrillator deployment and use

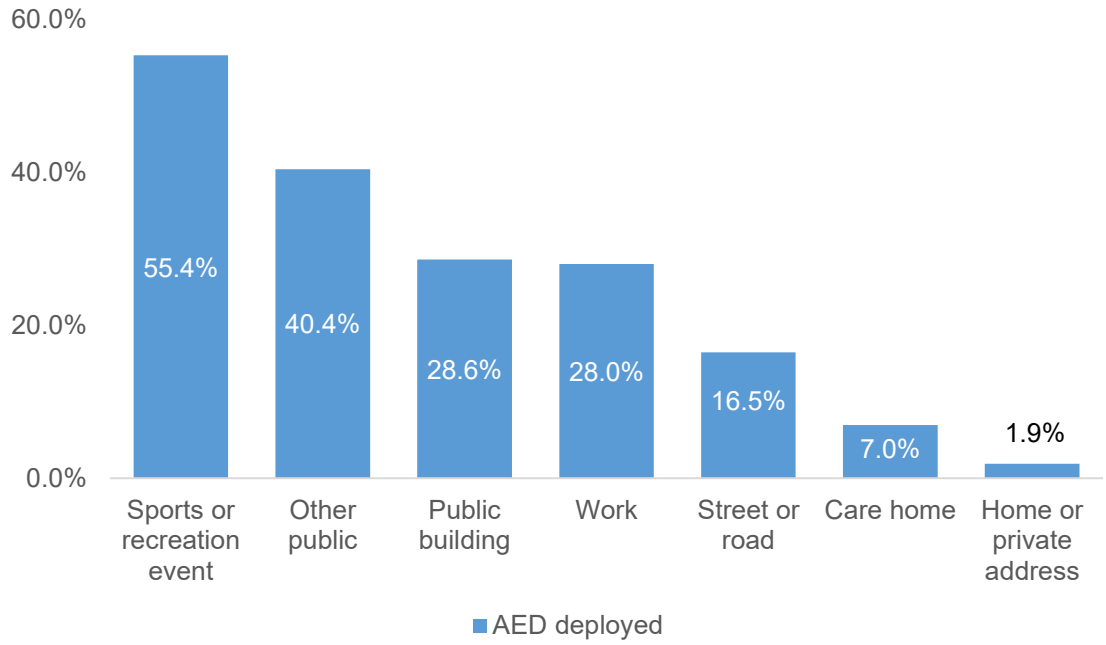

Figure 14: Defibrillator deployment by location

- **7.8%** (n=312) of patients who had resuscitation continued by LAS clinicians, had an **AED brought to them and attached** prior to LAS arrival. This figure is slightly lower than last year's (n=323).
- Just under half had at **least one shock** administered before LAS clinicians arrived on scene (**46.8%**, n=146/312), which is also lower than last year (50.5%).
- Patients were **most likely** to have an AED brought and attached to them when they collapsed at a **sports venue** or **recreational event** (**55.4%**).

3.6. Emergency medical dispatch

3.6.1. Call answering times

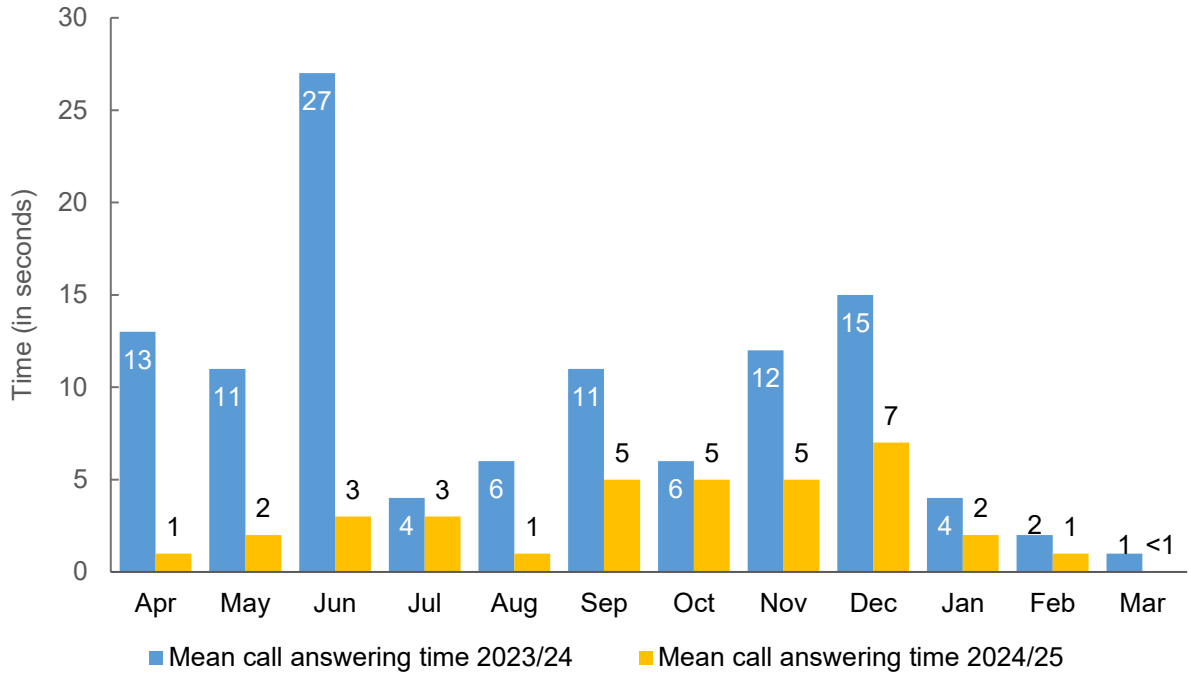

Figure 15: Mean call answering times per month (n=4,335)

Excludes calls transferred directly from another services (e.g. police or NHS 111) and with missing time data

- Average **call answering times** for patients who subsequently received resuscitation attempts by LAS clinicians continued to **improve**, standing at an average of **3 seconds** this year (compared with 42 seconds in 2022/23 and 9 seconds in 2023/24).
- The **longest** average call answering time was in **December 2024** (at 7 seconds) and the **shortest** in **March** 2025 (<1 second).

3.6.2. Chief complaints

The Chief Complaint is allocated during call handling and refers to the primary issue or reason reported by the caller for requesting emergency medical assistance. The table below contains the most frequent Chief Complaints allocated to patients who had resuscitation attempted by LAS.

Chief Complaint at call handling, n (%)	
Cardiac arrest	2,750 (59.4)
Breathing problems	348 (7.5)
Unconscious/fainting	314 (6.8)
Falls	186 (4.0)
NHS 111 Transfer	128 (2.8)
Convulsions/fitting	120 (2.6)
Chest pain	111 (2.4)
Other	674 (14.6)

Table 2: Chief Complaint allocated during call handling

N.B. Percentages may not total 100% due to rounding

3.7. Response times

The following section provides the internationally defined **clinical response intervals**, measured from the time of the '999 call' to 'arrival at scene' (in line with the Utstein definitions). These figures differ from those reported by the NHS England Ambulance System Indicators (AQIs), which use an alternative definition of the response interval[1].

[1] NHS England AQI response intervals are measured using Clock Start to Clock Stop, as per the national AmbSYS specification which is available at: https://www.england.nhs.uk/statistics/statistical%20work-areas/ambulance-quality-indicators/

Year	n	Mean	Median
2021-22	4,366	14:22	09:00
2022-23	4,610	16:06	09:36
2023-24	4,572	12:52	08:31
2024-25	**4,631**	**12:34**	**08:25**

Table 3: '999 call' to 'arrival at scene' clinical response intervals (mm:ss)

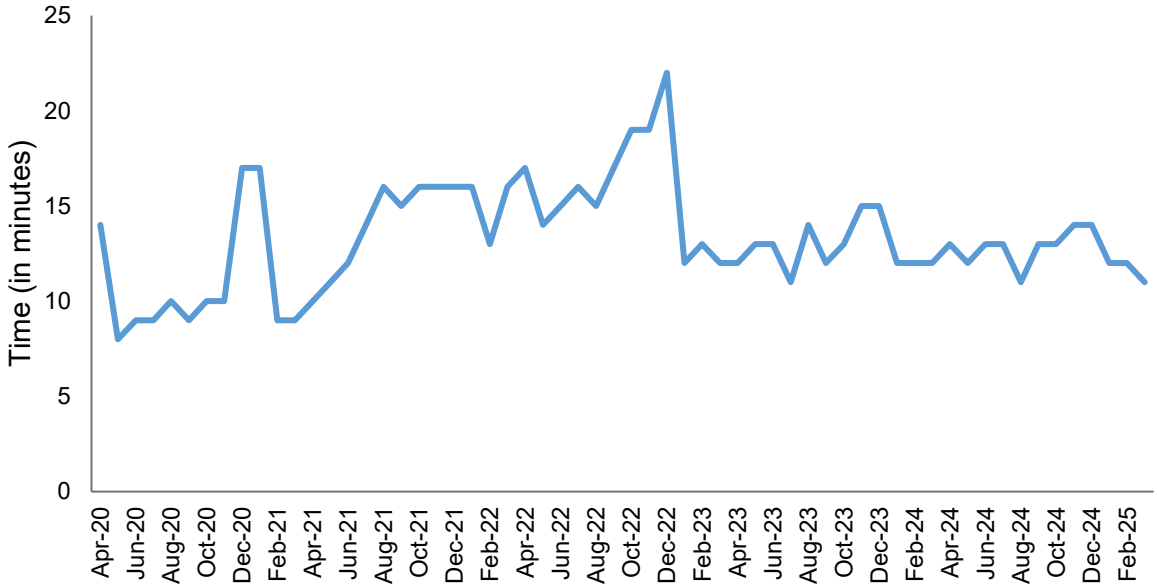

Figure 16: Clinical response interval over 5 years (where LAS attempted resuscitation)

- The clinical response interval **improved slightly** compared to the last year, with a mean of **12:34,** and is the fastest time seen over the past four years.
- Average response times fluctuated over the year. The **longest** average response time was in **December** (14:19), while the shortest occurred in **March** (10:33).

3.8. Key clinical intervention intervals

Year	Interval	n	Mean	Median
2024-25	**999 call^ – LAS CPR***	**2,651**	**14:38**	**10:47**
	999 call^ – LAS defibrillation*~	**646**	**13:36**	**11:04**
2023-24	999 call^ – LAS CPR*	2,560	14:14	10:56
	999 call^ – LAS defibrillation*~	590	12:56	10:55

Table 4: Key time intervals from 999 call (mm:ss) compared with last year

*^ Time the 999 call was connected to the ambulance service. * Excludes LAS witnessed arrests and incidents where times were not documented. ~Based on an initial rhythm of VF/VT*

- The mean time from **999 call to LAS defibrillation** was **longer** this year compared to 2023/24.
- **Missing data** continued to impact the reliability of this metric. CPR times were unavailable for over one third of incidents, and defibrillation times were not recorded for nearly one in ten patients. As such, findings should be treated with caution.

3.9. Clinical presentation

3.9.1. Aetiology

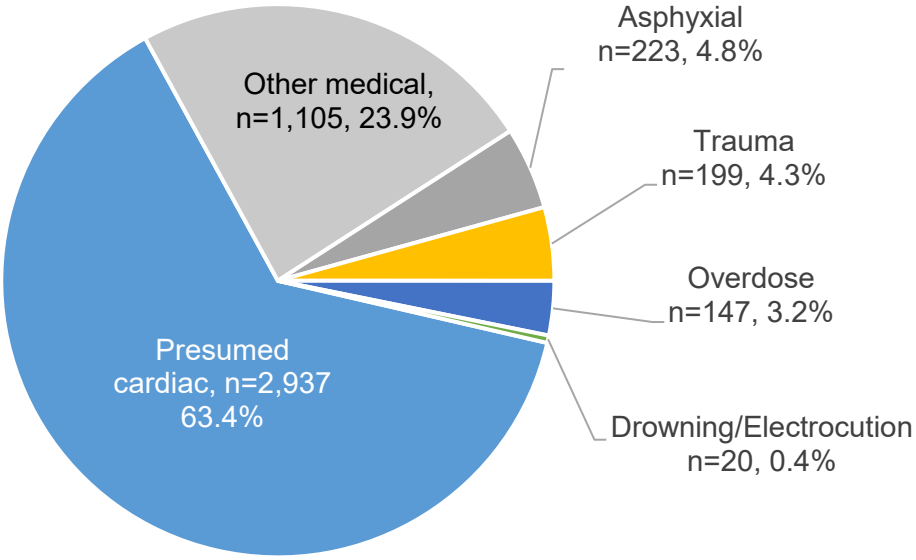

Figure 17: Breakdown of aetiology of cardiac arrests where LAS attempted resuscitation

- The most common cause of cardiac arrest was **presumed cardiac** (**63.4%**).
- Traumatic arrests accounted for 4.3% (n=199) of OHCAs that most frequently affecting younger patient groups, particularly those aged 20-29.

3.9.2. Initial arrest rhythm

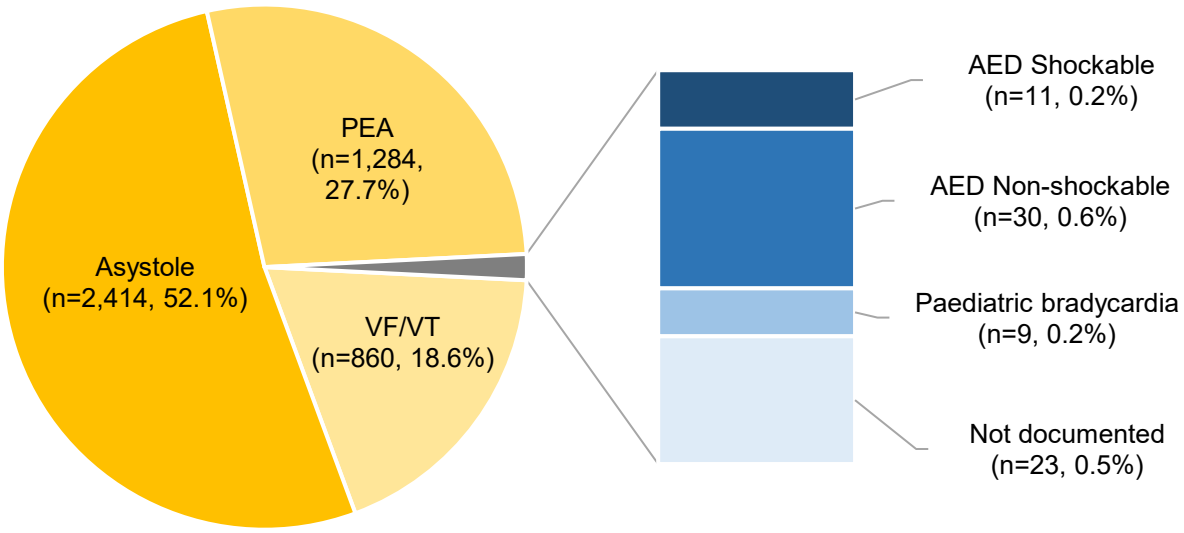

Figure 18: Breakdown of initial recorded cardiac arrest rhythm

Percentages may not total 100% due to rounding

- **More than half of patients** presented in **asystole** (**52.1%**, n=2,414). This is slightly higher than the figure reported last year (50.9%) and in line with the figure reported in 2022/23 (52.0%).
- The proportion of patients presenting with a **shockable rhythm** has seen a modest increase again this year, reaching **18.8%** (n=871), up from 18.5% in 2023/24 and 17.7% in 2022/23.
- There has been a notable improvement in documenting the initial rhythm, with 99.5% (n=4,408) of patients having this recorded, compared to 98.3% last year.

3.10. Conveyance

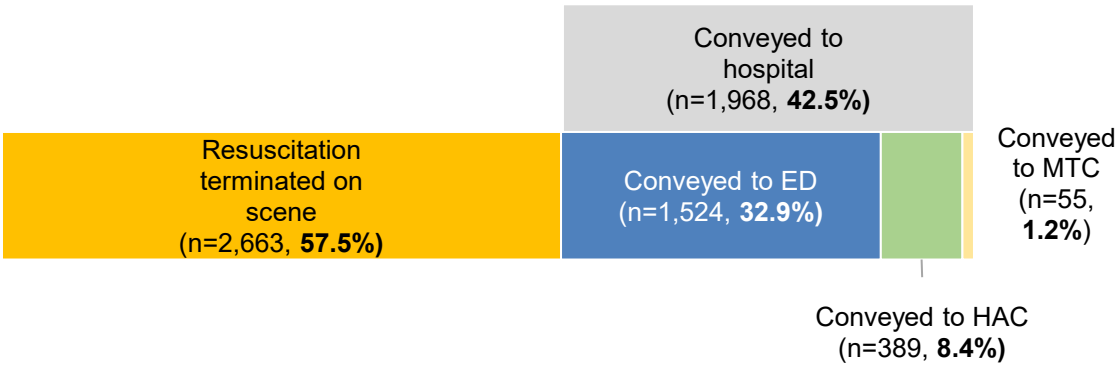

Figure 19: Breakdown of conveyance by destination

- Resuscitation efforts were **terminated on scene** for over half of patients.
- When conveyed, the mast majority were taken to an **Emergency Department** (ED) (**77.4%,** n=1,524/1,968).
- Consistent with last year, a small proportion of patients were taken to specialist facilities: Heart Attack Centres (HACs) (19.8%, n=389) and Major Trauma Centres (MTCs) (2.8%, n=55).

4. Patient outcomes

This section presents outcome data for two groups:

1. **Overall group**: all patients when resuscitation was attempted by the LAS.
2. **Utstein comparator group**: a sub-group of patients who had resuscitation attempted following an OHCA of presumed cardiac aetiology, which was bystander witnessed and initially presented in a shockable rhythm. The completed Utstein Template is presented in Appendix 3.

   N.B., Utstein definitions have been updated expanding the denominator from presumed cardiac to all cardiac arrests with resuscitation attempted (regardless of aetiology). As NHS England's AQIs continue to report the original Utstein comparator group, and for ease of comparison, we continue to use the original

calculation. We will move to the newer, expanded survival calculation when the AQI's are updated and will recalculate our historical figures for comparison.

4.1. ROSC sustained to hospital

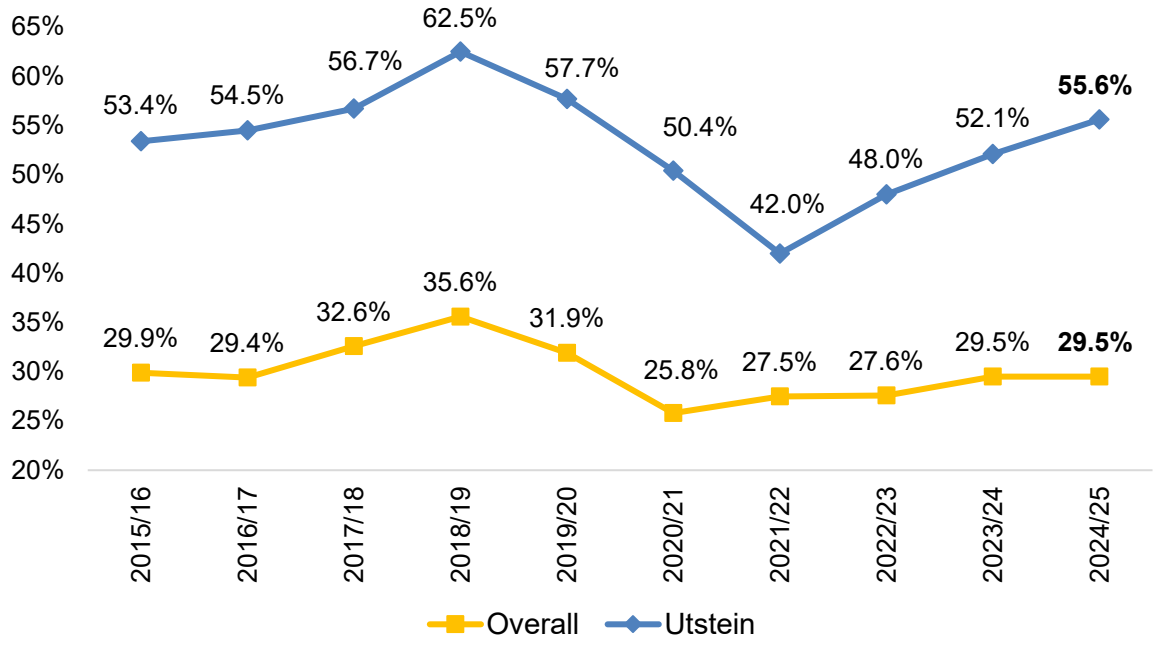

Figure 20: ROSC sustained to hospital over the past 10 years

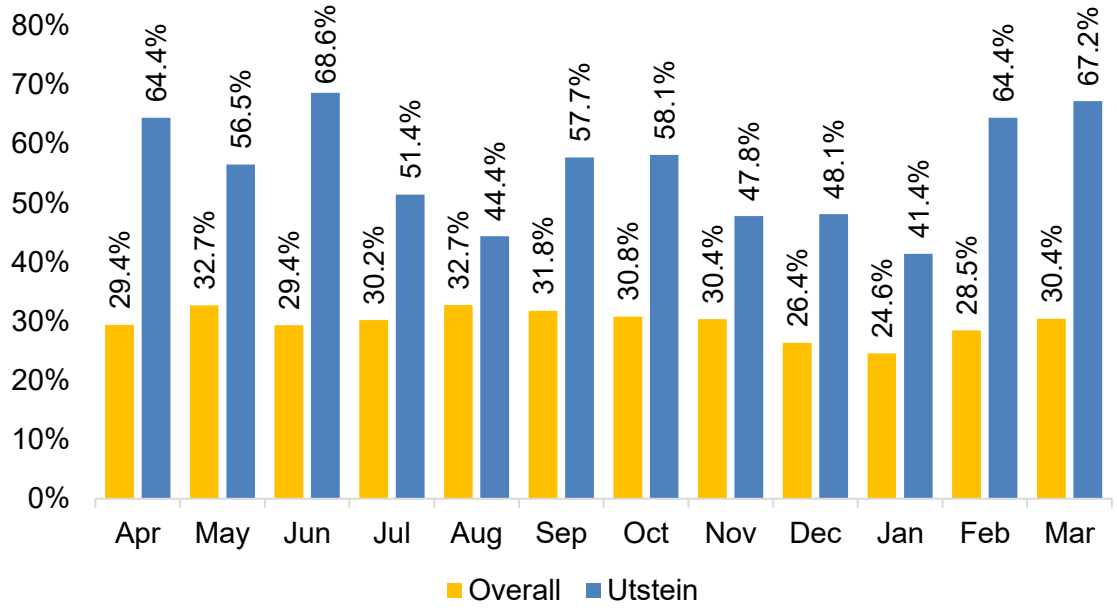

Figure 21: ROSC sustained by month

4.2. Survival to 30 days

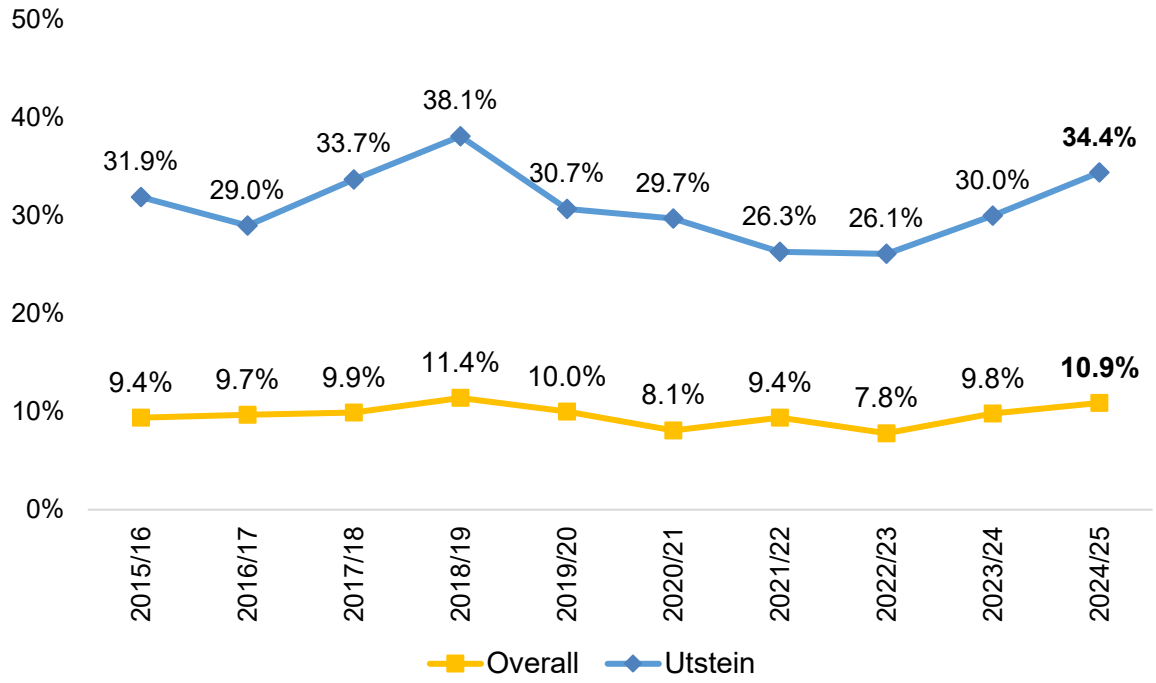

Figure 22: Survival to 30 days over the past 10 years

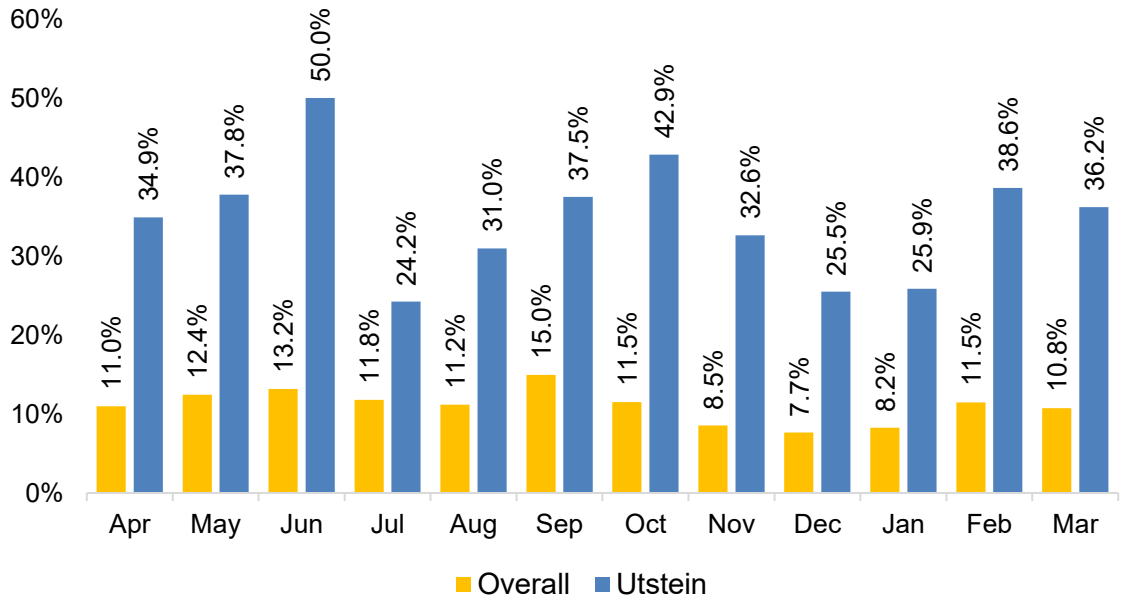

Figure 23: Survival to 30 days per month

- **Overall ROSC** sustained to hospital remained the **same as last year** at 29.5%.
- Amongst the **Utstein** comparator group, the proportion of patients who achieved and sustained **ROSC** until hospital arrival **increased** from last year by 3.5 percentage points, continuing the upward trend since 2021/22.
- **10.9%** of patients (n=494) in the **overall** group were **alive** 30 days after their arrest – this is the **second-highest** survival rate reported within the past 10 years (surpassed by 11.4% in 2018/19). This marks a strong improvement from the low of 7.8% in 2022/23, suggesting a return to pre-pandemic survival levels.
- In the **Utstein** comparator group the survival rate was **34.4%**, also representing the highest figure since 2018/19 (when the survival rate for this group peaked at 37.8%).

Group	Survival to 30 days	
	LAS	National Average
Overall group	10.9%	9.6%
Utstein comparator group	34.4%	29.9%

Table 5: LAS survival compared with the national average for England (AQIs)

- The LAS's 30-day survival rates continue to **exceed the national average**, with an overall survival rate of 10.9% compared to the national average of 9.6%, and the Utstein comparator group survival rate of 34.4% compared with 29.9%.

4.3. Survival by patient and arrest characteristics

The table below shows the proportion of patients who survived to 30 days within groups of characteristics of interest.

Characteristic	% of each group that survived to 30 days
Sex	12% of males survived to 30 days 8% of females survived to 30 days
Age group	18% of patients aged 0-9 19% of patients aged 10-19 16% of patients aged 20-29 16% of patients aged 30-39 18% of patients aged 40-49 17% of patients aged 50-59 12% of patients aged 60-69 7% of patients aged 70-79 4% of patients aged 80-89 2% of patients aged 90+
Location of OHCA	39% in sports or recreational event 29% in ambulance 24% at work 20% in a public building 17% in street or road 15% in other public location 8% at home or private address 2% at care home
Witness status	25% when LAS witnessed 12% when bystander witnessed 4% when unwitnessed
Bystander CPR	10% of patients who received bystander CPR 6% of patients who did not receive bystander CPR
Bystander defibrillation	33% of those who received bystander defibrillation shocks 8% of those where bystander defibrillation was not given
Aetiology	14% of overdose patients 13% with presumed cardiac aetiology 13% of drowning cases 7% who had an asphyxial cause of arrest 6% who had other medical cause of arrest 5% of patients with traumatic cardiac arrests
Initial rhythm	38% of those with a shockable rhythm 4% of those with non-shockable rhythm
Destination	59% of patients transported to Heart Attack Centre 32% of patients transported Major Trauma Centre 18% of patients transported to Emergency Department

Table 6: Survival to 30 days within each characteristic group

5. Discussion

Survival rates for out-of-hospital cardiac arrest in London continue to improve, reaching the highest level in six years. This positive trend may be linked to the continued enhancements we have observed in our response across a number of key areas, including faster call answering and reductions in call-to-arrival times.

The likely impact of these quicker responses on survival is particularly significant given the potentially negative impact of declining bystander CPR rates that are now at their lowest in six years (mirroring a reduction in bystander witnessed arrests).

The LAS is committed to proactively enhancing bystander intervention rates by equipping members of the public with the necessary skills and confidence to perform lifesaving interventions prior to the arrival of the ambulance service. Over 8,000 members of the public became registered 'London Lifesavers' this year after receiving first aid training from the LAS First Responder Department. Additionally, during 2024/25, 13,000 pupils were trained in lifesaving skills through the London Lifesaver Schools Programme.

In July 2024, along with the London Ambulance Charity, the LAS launched the London Heart Starters Campaign to promote the use of Public Access Defibrillators (PADs). To date, this campaign has facilitated the placement of over 200 PADs across London, with a strategic focus on areas with limited or no access to lifesaving equipment, helping to address health inequalities across the capital. We have also continued our partnership with Transport for London to support training and the provision and maintenance of PADs throughout the London underground network.

Further community engagement has been driven through our partnership with the GoodSam network. The LAS aims to increase the number of accepted alerts by engaging responders through thank-you emails and ongoing communication aimed at identifying and mitigating barriers that may hinder alert acceptance. Additionally, work is underway to improve data accuracy by promoting the correct use of the mobile application by responders when they accept alerts and arrive on scene.

Our commitment to advancing the evidence base for cardiac arrest care through impactful clinical research remained strong through 2024/25. We successfully completed patient enrolment for the PARAMEDIC-3 trial, which investigated the optimal route of adrenaline administration in pre-hospital cardiac arrest. Throughout the study, we enrolled 2,339 patients—contributing over one-third of the total recruitment across the UK. We also finished recruiting to the RAPID-MIRACLE study, which assessed the potential application of a prognostication scoring tool in pre-hospital cardiac arrest. In total we enrolled 292 patients into this study. Additionally, during this reporting year, we co-authored five peer-reviewed scientific publications to inform and improve the care, treatment and outcomes for people experiencing out-of-hospital cardiac arrest, not only in London, but worldwide.

We have continued to actively support national research efforts by contributing data to the UK Out-of-Hospital Cardiac Arrest Outcomes (OHCAO) project, as well playing a key role in the associated project management and steering groups. In parallel, we continue to submit data to the NHS England Ambulance Quality Indicators (AQI) programme, enabling national benchmarking and quality improvement across all English ambulance trusts.

We continue to recognise and celebrate the outstanding efforts of our call handlers, dispatchers and clinicians in delivering exceptional patient care and helping our patients have the best possible outcomes. During 2024/25, CARU sent 3,720 letters to LAS staff who contributed to the care of all patients who survived to 30 days, thanking them for the crucial role they played in each patient's survival.

Finally, in November 2024, CARU launched a new interactive monthly cardiac arrest report that allows clinicians to access detailed information about the quality of care they have personally provided to OHCA patients. As well as highlighting trends and areas of good practice, these reports provide enhanced opportunities for clinical feedback, which is expected to drive further improvements in cardiac arrest management by LAS clinicians.

References

1. Recommended guidelines for uniform reporting of data from out-of-hospital cardiac arrest: the Utstein Style. Task Force of the American Heart Association, the European Resuscitation Council, the Heart and Stroke Foundation of Canada, and the Australian Resuscitation Council. Ann Emerg Med. 1991 Aug;20(8):861-74.

Appendix 1 – Patients found to be ROSC on arrival of LAS (n=49)

49 patients were reported to have received bystander defibrillation and were found in ROSC upon LAS arrival. As a result, further resuscitation efforts were not required. Additional details regarding this patient group are provided in the table below. It should be noted that, due to low availability of defibrillator download data, it is not possible to verify that these patients had been in cardiac arrest and were defibrillated.

AED use	Defibrillator shock delivery reported by bystanders (100.0%) Defibrillator shock delivery confirmed by a download (14.3%)
Witnessed status	Arrest witnessed by bystander (93.9%)
Dispatcher assisted CPR	CPR instructions provided (42.9%)
Bystander CPR	Bystander CPR provided (100.0%)
GoodSam responders	Responder on scene (6.1%) Responder arrived before LAS (2.0%)
Location	Sports or recreational event (38.8%) Street or road (20.4%) Public building (16.3%) Other public location (14.3%) Work (8.2%) Home or private address (2.0%)
Sex	Male (85.7%) Female (14.3%)
Age	Mean (56) Median (61)
Destination	ED (67.3%) HAC (30.6%) MTC (2.0%)
Survival	Survived to 30 days (93.9%) Unknown (6.1%)

Table 7: Patients found in ROSC on LAS arrival

Appendix 2 – Outcomes by bystander intervention (where LAS continued resuscitation)

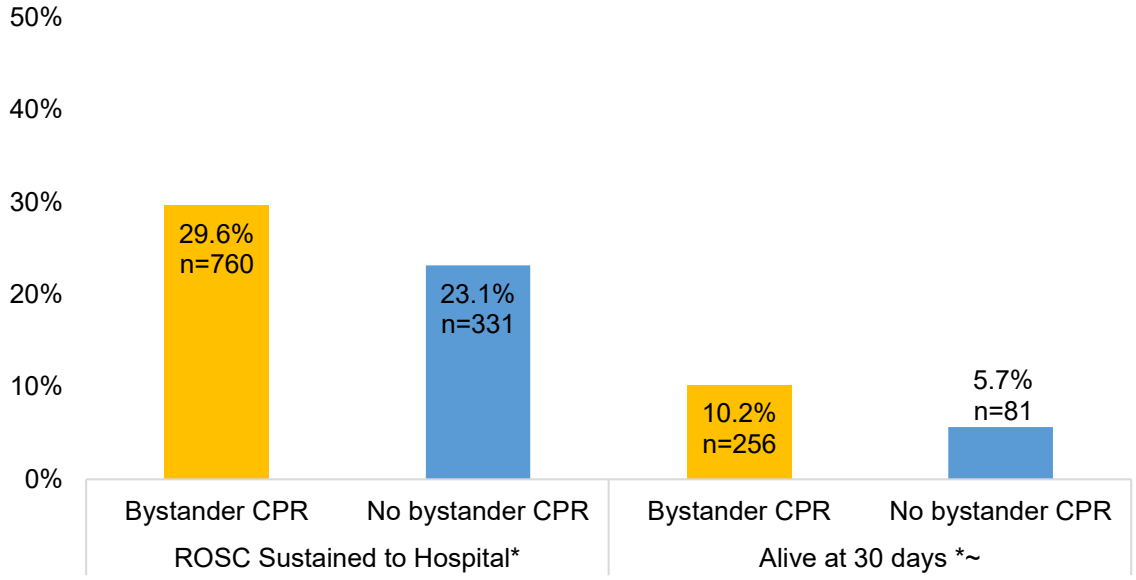

Figure 24: Outcomes for patients by bystander CPR

**Excludes LAS clinician witnessed cardiac arrests. ~Excludes 70 patients where outcome data were unavailable.*

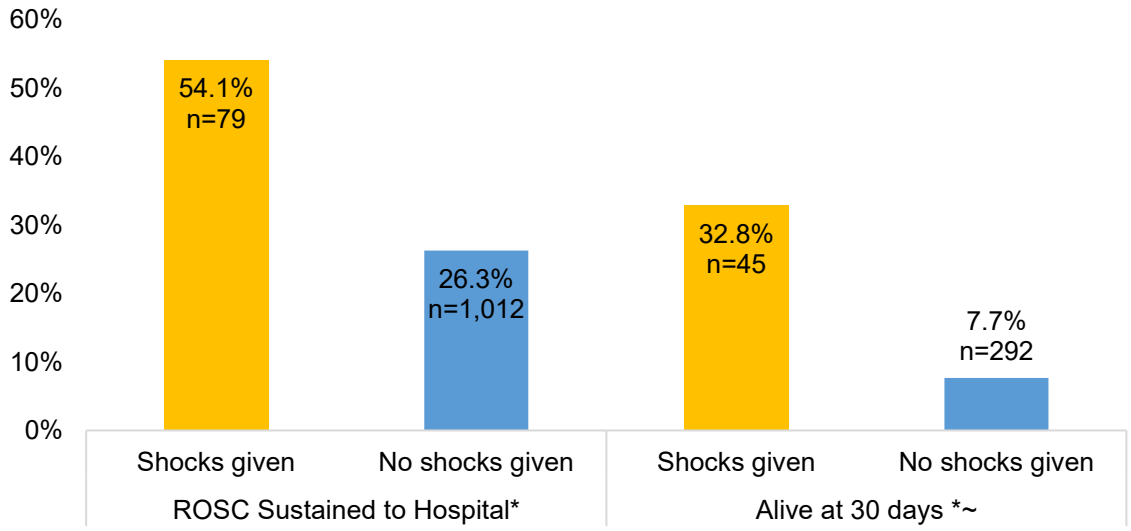

Figure 25: Outcomes for patients by bystander defibrillation

**Excludes LAS clinician witnessed cardiac arrests. ~ Excludes 70 patients when outcome data were unavailable.*

- **ROSC** sustained to hospital arrival was achieved for **29.6%** of patients, who **received bystander CPR** and then had LAS continue the resuscitative efforts**,** compared to **23.1%** of patients who did not receive CPR prior to the arrival of LAS clinicians.
- **30-day survival** was **10.2%** among patients who received **bystander CPR**, compared to 5.7% in those who did not.
- Among patients who received a **defibrillation by bystanders** and then had resuscitation continued by LAS clinicians, **54.1%** achieved and **maintained ROSC** until hospital arrival, compared to 26.3% of those who did not receive bystander defibrillation.
- The proportion of patients, who **received bystander defibrillation** and **survived** their cardiac arrest to at least 30 days, **was 32.8%**. In contrast, among the patients who did not receive pre-LAS defibrillation, survival to 30 days was 7.7%.

Appendix 3 – Utstein Survival Template