



Cardiac Arrest Annual Report 2004-2005

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Introduction

The following information is based on 3257 patients who were resuscitated by the London Ambulance Service NHS Trust (LAS), during the period April 1st 2004 to 31st March 2005, following an out-of-hospital cardiac arrest of a presumed cardiac cause. The information for this report was collected from LAS Patient Report Forms (PRFs), Mobile Data Terminals (MDTs) and Emergency Operations Centre (EOC) records. Patient hospital outcomes were collected from receiving A&E hospital records and from two national databases: the Myocardial Infarction National Audit Project (MINAP) database and the National Strategic Tracing Service database. This report presents figures for the whole of the LAS. Specific Complex-based information for this period can be found in the Quarterly Cardiac Arrest Complex Reports that were published within the LAS Clinical Education & Patient Care Updates.

Table 1: Key findings:

2004 – 2005	
Patient Details	
Number of Patients	3257
Average Age	67 (0-103) years
Gender	Male (64%); Female (36%)
Average Age by Gender	Male (65 years); Female (71 years)
Event Information	
Most Frequent Month	December (11%; n=344)
Most Frequent Day	Saturday (16%; n=507)
Most Frequent Time	08:00-12:00 (24%; n=780)
Incident Location	Private (73%; n=2392) Public (27%; n=865)
Witnessed Arrest	Bystander (49%; n=1591) Not witnessed (39%; n=1274) LAS crew witnessed (12%; n=392)
Bystander CPR	34% (n=985/2865) [^]
Initial Cardiac Arrest Rhythm	Asystole (48%; n=1557) VF/VT (27%; n=885) PEA (20%; n=665) Other/Missing (5%; n=150)
Return of Spontaneous Circulation (ROSC)	17% (n=567)
Average Response Times	
999 Call* – Arrival On Scene	7 minutes (0-95)
999 Call* – First LAS Defibrillation**	9 minutes (2-46)
Arrival At Scene – First LAS Defibrillation **	3 minutes (0-36)
999 Call* – Arrival At Hospital	39 minutes (6-131)

* Time when the incident location and the patient's chief complaint were established by EOC.

** Initial arrest rhythm of VF/VT and excluding LAS crew witnessed arrests.

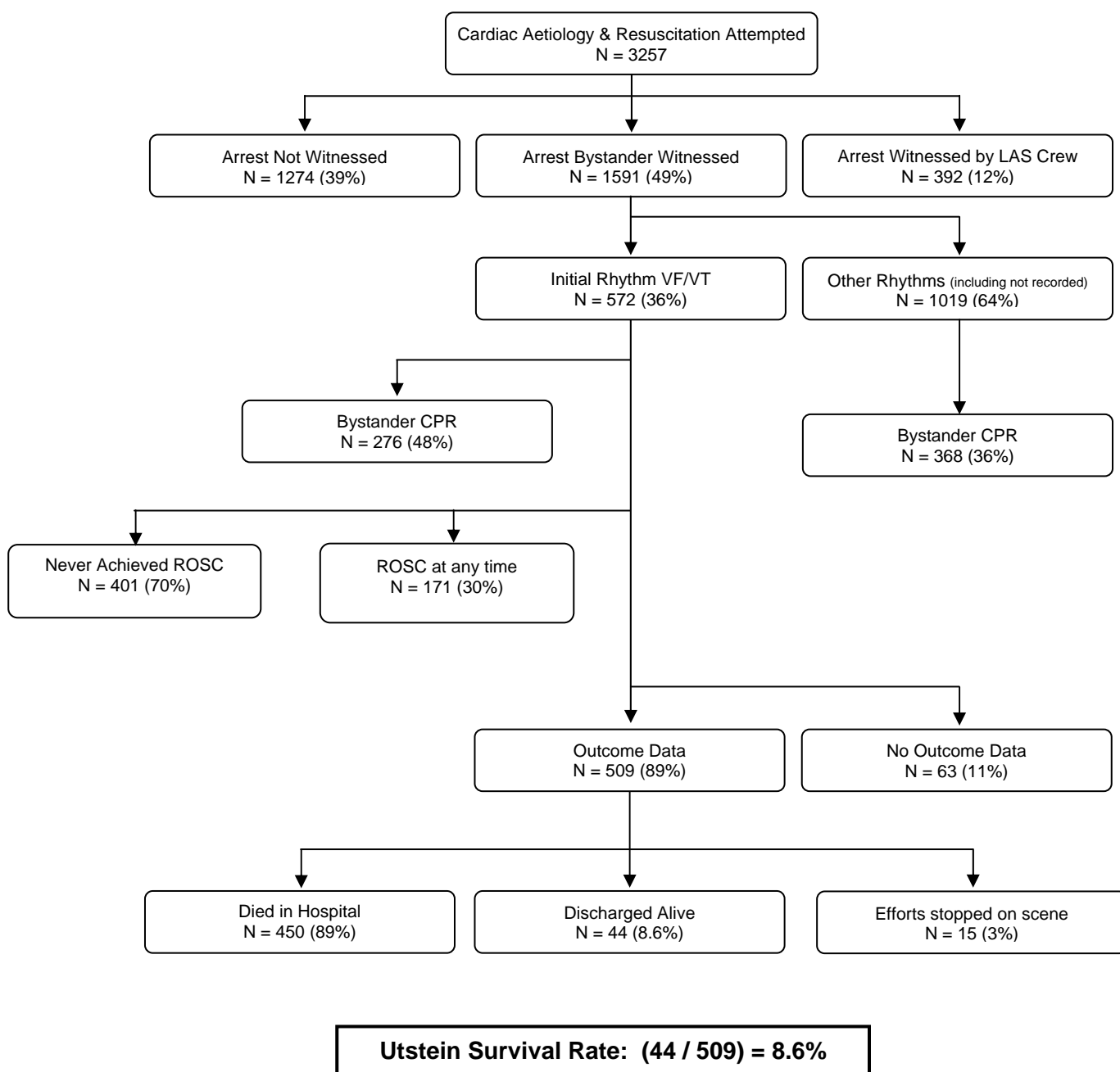
[^] Excluding LAS crew witnessed arrests.

Survival Calculations

The LAS produces two survival rates: the Utstein survival rate and the overall survival rate.

Utstein Survival Rate

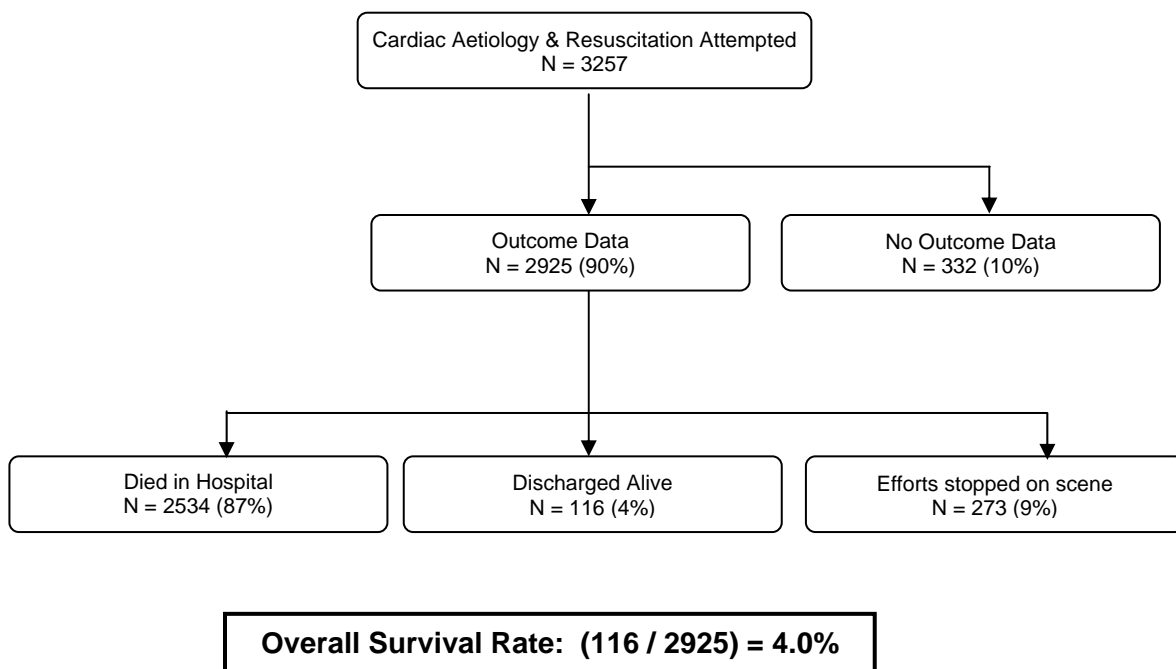
The Utstein survival calculation¹ is an internationally validated method for calculating survival rates that enables comparisons across services. This calculation reports the number of patients discharged alive divided by the number of persons with a witnessed arrest and an initial rhythm of VF/VT, who had resuscitation attempted following a cardiac arrest of presumed cardiac aetiology. The outcome of patients whose records could not be traced through hospitals cannot be assumed, therefore these patients (n=63) have been removed from the survival calculation. The valid denominator for the Utstein survival calculation is 509.



¹ Cummins RO, Chamberlain, DA, Abramson, NS, et al. Recommended Guidelines for Uniform Reporting of Data from Out-Of-Hospital Cardiac Arrest: The Utstein Style. *Ann. Emerg. Med.*, 1991; 20:861-873.

Overall Survival Rate

The LAS also reports an overall survival to hospital discharge figure for all patients whose arrest was of a presumed cardiac cause and for whom the LAS commenced resuscitation. This figure is simply the total number of patients who were discharged alive from hospital. As in the Utstein template, the number of patients whose outcome could not be traced (n=332) have been removed, and the valid denominator for this survival calculation is 2925.



Discussion

The LAS's cardiac arrest survival rate has increased again, with the 2004/05 Utstein survival figure rising from 8.1% in 2003/04 to 8.6%, and the overall survival rate rising from 3.2% in 2003/04 to 4%. This increase represents another in a continuing pattern of year upon year increases.

There are a number of factors that have contributed to the increased survival figures. One such factor is an increased level of bystander CPR. Effective bystander CPR has been demonstrated to triple the chance of survival from a witnessed out-of-hospital cardiac arrest². The overall rate of bystander CPR is now 34% (48% for patients that had a bystander witnessed arrest with an initial rhythm of VF/VT), which is an increase of 5% from the previous year.

Patients who arrested in a public place were twice as likely to receive bystander CPR as patients who arrested at a private address (54% vs. 27%). At present almost three-quarters of cardiac arrests in London occur in a private residential location, a figure that has remained relatively consistent for a number of years. Research has shown that if a person arrests in

² Helitz J, Ekstrom L, Wennerblom B, et al. Effect of bystander initiated cardiopulmonary resuscitation on ventricular fibrillation and survival after witnessed cardiac arrest outside hospital. *British Medical Journal*, 1994; 72(5): 408-12.

private there may be only one other person on scene who is likely to be older and less likely to be trained in CPR³. Therefore, it is essential that the relatives and friends of people who suffer from Coronary Heart Disease are encouraged to train in CPR, as these individuals have a greater chance of witnessing an out-of-hospital cardiac arrest. They should also receive instruction in the recognition of the signs and symptoms of a heart attack, and information about what is required if they need to call 999.

Telephone CPR instructions, provided by Emergency Medical Dispatchers (EMDs), are vital in increasing the number of cardiac arrest patients that receive bystander CPR prior to the arrival of the ambulance. In December 2004, the LAS launched the Dispatcher Assisted Resuscitation Trial (DART). This ground-breaking research project is being conducted in collaboration with King County Emergency Medical Service and the University of Washington, USA and involves EMDs instructing certain callers to give chest compression-only CPR. The DART trial will examine whether compression-only CPR is linked to improved patient survival compared with standard chest compression and ventilation CPR. This study is on-going, with regular updates published in the LAS's bi-annual Capital Heartbeat Newsletters.

Other factors that will have contributed to the improved survival figure are faster response and defibrillation times. In London, Automated External Defibrillators (AEDs) for use by the public have been placed at many sites that have a large 'foot fall' count, which includes airports, shopping centres, and train and London Underground stations. The use of these AEDs by members of the public, prior to arrival of the ambulance crew, could make a large contribution to increasing patient survival.

This year has seen a great improvement in our ability to trace cardiac arrest patient outcomes. In terms of the Utstein calculation, 89% of patient outcomes were traced in comparison to 72% in 03-04, and 57% in 02-03. This ultimately means that we can have more confidence in the survival figures that we produce as they are a more accurate representation of patient survival in London. The increase in tracing patient outcomes was largely due to the support and co-operation we received from our NHS colleagues at the hospital trusts that supplied the majority of patient outcomes. Furthermore, we gained access to two national patient databases, which allowed us to add to the data provided by the hospitals. The aim for next year's annual report is to further reduce the number of missing patient outcomes. For this to be achieved, patient outcomes (if known) must be recorded on the LAS PRF, so that hospitals are requested to trace as few patients as possible. It can also still take up to six months before a patient's outcome is requested, and this can prove difficult for some hospitals to retrieve information and provide it to the LAS. Clearly, work must continue to ensure that the speed at which data flows through the LAS is improved wherever possible. For example, the process by which the LAS selects cardiac arrest PRFs, and then extracts information from them, could be made easier (and therefore quicker), if the overall level of LAS PRF documentation was further enhanced.

³ Swor RA, Jackson RE, Compton S, et al. Cardiac arrest in private locations: different strategies are needed to improve outcome. *Resuscitation*, 2003 Aug; 58(2): 171-6.

Points for Action:

- The LAS should increase the timeliness by which PRFs are made available for cardiac audit. This may be achieved by further streamlining the internal processes through which PRFs are delivered to Management Information, selected for data entry, and the information inputted. This would enable the LAS to trace patient outcomes more quickly (and thus increase the accuracy of survival figures) and provide more up-to-date performance and treatment statistics.
- As the PRF is the main source from which the majority of cardiac arrest information is obtained, efforts must continue to promote and ensure complete, accurate and legible PRF documentation. PRF documentation quality has been shown to improve when the LAS Team Leader Clinical Performance Indicators (CPIs) are undertaken on a routine basis. Team Leaders must be allocated 'protected' time that is dedicated to CPI completion so that this can be achieved.
- Through its Community Resuscitation Training Team, the LAS may wish to target resuscitation training and education at families and friends of people with a known history of Coronary Heart Disease. This could be achieved through building links with hospital cardiac rehabilitation programmes (for people that have suffered a myocardial infarction (MI) or survived a cardiac arrest) and GP surgeries. In addition, other methods of reaching these patients should be considered, such as the provision of material that outlines clear practical instructions about what to do when calling 999 in the event of someone having a possible MI or cardiac arrest.