Out-of-Hospital Cardiac Arrest Outcomes Project Epidemiology Report

National Out of Hospital Cardiac Arrest Outcomes Project

OHCA Survival in England

Perkins & Cooke, 2011
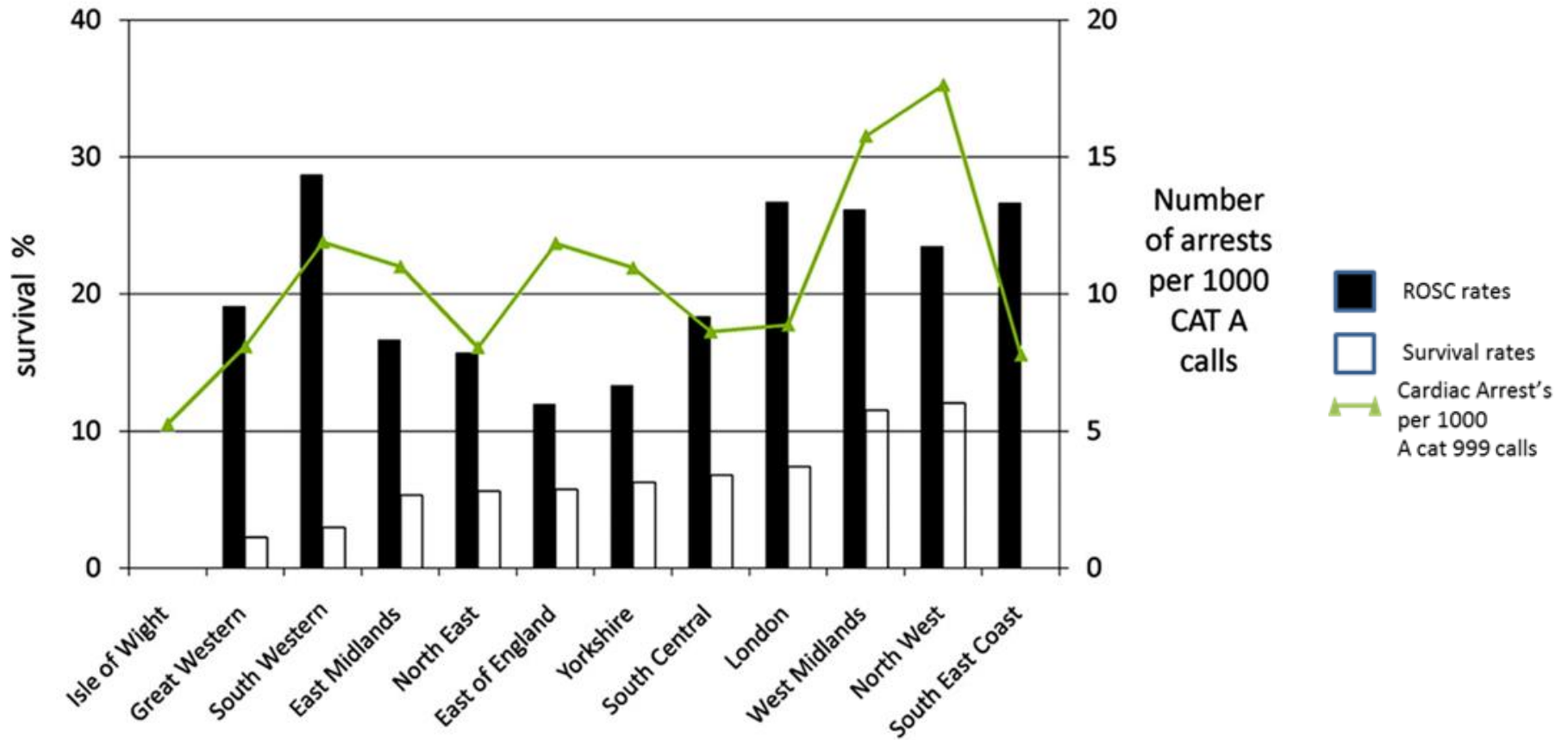
"save 1000 lives a year"

Early recognition and call for help - to prevent cardiac arrest

Early CPR - to buy time

Early Defibrillation - to restart the heart

Post resuscitation care - to restore quality of life
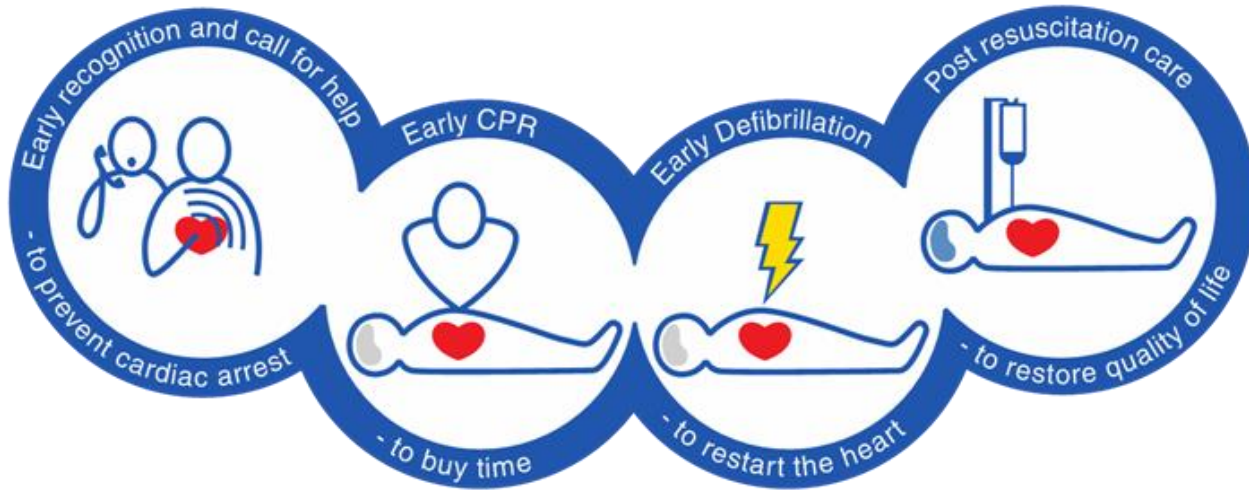
WARWICK
CLINICAL TRIALS UNIT
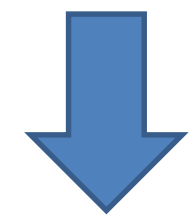
YOU CAN'T IMPROVE WHAT YOU DON'T MEASURE.

Analyze

Improve

Measure

OHCA National Framework

RESUSCITATION TO RECOVERY

A National Framework to improve care of people with out-of-hospital cardiac arrest (OHCA) in England

March 2017

☑ Data should be submitted to the national Out-of-Hospital Cardiac Arrest Outcomes (OHCAO) Registry so that performance and progress towards improved survival rates can be monitored and unwarranted variation can be addressed; appropriate local resources must be allocated for these audit purposes

ILCOR Consensus Statement

Cardiac Arrest and Cardiopulmonary Resuscitation Outcome Reports: Update of the Utstein Resuscitation Registry Templates for Out-of-Hospital Cardiac Arrest

System	Dispatch	Patient	Process	Outcome
Population served	**Dispatcher identified cardiac arrest**	**Age**	**Response times**	**Survived event**
Cardiac arrests attended		**Gender**	**Defibrillation time**	**Any ROSC**
Resuscitation attempted	**Dispatcher CPR instructions**	**Witnessed arrest**	**Target temp control**	**30 day survival / survival to discharge**
Resuscitation not attempted		**Arrest location**	**Drugs**	**Neurological outcome**
System description		**Bystander CPR/AED**	**Reperfusion attempted**	
		First monitored rhythm		
		Etiology		

C O R E

Perkins GD, Jacobs IJ, Nadkarni VM, et al 2015

BMJ Open The UK Out of Hospital Cardiac Arrest Outcome (OHCAO) project

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ABSTRACT

Introduction: Reducing premature death is a key priority for the UK National Health Service (NHS). NHS Ambulance services treat approximately 30 000 cases of suspected cardiac arrest each year but survival rates vary. The British Heart Foundation and Resuscitation Council (UK) have funded a structured research programme—the Out of Hospital Cardiac Arrest Outcomes (OHCAO) programme. The aim of the project is to establish the epidemiology and outcome of OHCA, explore sources of variation in outcome and establish the feasibility of setting up a national OHCA registry.

Methods and analysis: This is a prospective observational study set in UK NHS Ambulance Services. The target population will be adults and children sustaining an OHCA who are attended by an NHS ambulance emergency response and where resuscitation is attempted. The data collected will be characterised broadly as system characteristics, emergency medical services (EMS) dispatch characteristics, patient characteristics and EMS process variables. The main outcome variables of interest will be return of spontaneous circulation and medium—long-term survival (30 days to 10-year survival).

Ethics and dissemination: Ethics committee permissions were gained and the study also has received approval from the Confidentiality Advisory Group Ethics and Confidentiality committee which provides authorisation to lawfully hold identifiable data on patients without their consent. To identify the key characteristics contributing to better outcomes in some ambulance services, reliable and reproducible systems need to be established for collecting data on OHCA in the UK. Reports generated from the registry will focus on data completeness, timeliness and quality. Subsequent reports will summarise demographic, patient, process and outcome variables with aim of improving patient care through focus quality improvement initiatives.
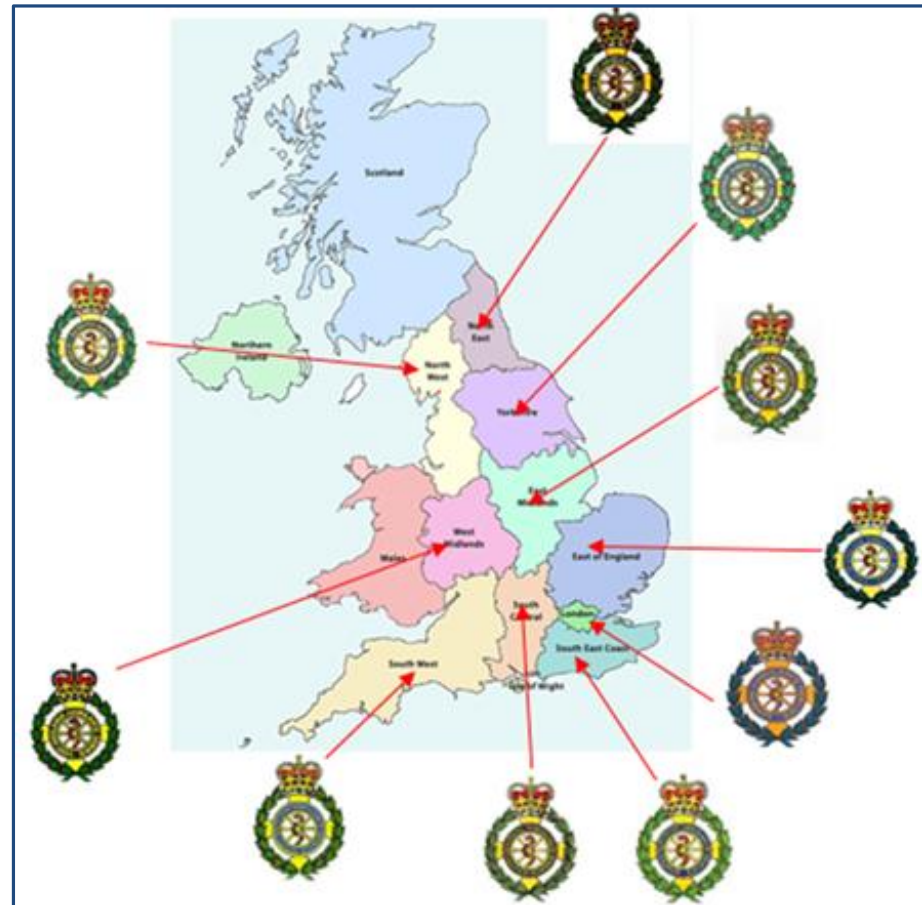
Strengths and limitations of this study

- Successful accomplishment of objectives highly likely to improve understanding and improve outcomes from UK population, and potential to influence national policy and procedures.
- This is a unique opportunity to study the impact of 'process' on national patient outcomes.
- The development of operational procedures, standardised data collection processes and data definitions.
- Reliance on already stretched National Health Service (NHS) resources.

reported successful initial resuscitation (13–27%) and survival to hospital discharge (2–12%).[5] Nichol *et al* identified evidence of regional variation in incidence and outcomes from OHCA in 10 North American sites. There was more than 100% variability in incidence (rates ranging from 71 to 160/100 000 population) and similar variability in the decision to start resuscitation. Of those patients where resuscitation was started by the emergency medical service (EMS) there was marked variation in survival rates (range 3.0–16.3%, with a median of 8.4% (IQR, 5.4–10.4%).[4]

Differences in outcomes may occur due to random variation (so called common-cause variation) or due to non-random/special cause variation. The former is to be expected in any process or system, while the latter is a systematic or unexpected deviation from the norm and may highlight an area worthy of further investigation. Evaluation of the English ambulance services return of spontaneous circulation (ROSC) and survival to discharge rates suggests there may be special cause variation (see figure 1).

Potential explanations for special cause variability

Lilford *et al*[3] describes a pyramid with five causes of non-random/special variation in health outcomes (data, case mix, structure,

INTRODUCTION

Reducing premature death is a key priority for the National Health Service (NHS).[1] [2] NHS Ambulance Services treat approximately 30 000 patients a year for out of hospital cardiac arrest. There is significant variability between ambulance services in rates of the

2015

Annual OHCA Epidemiology and Outcomes

Data completeness of key cardiac arrest variables
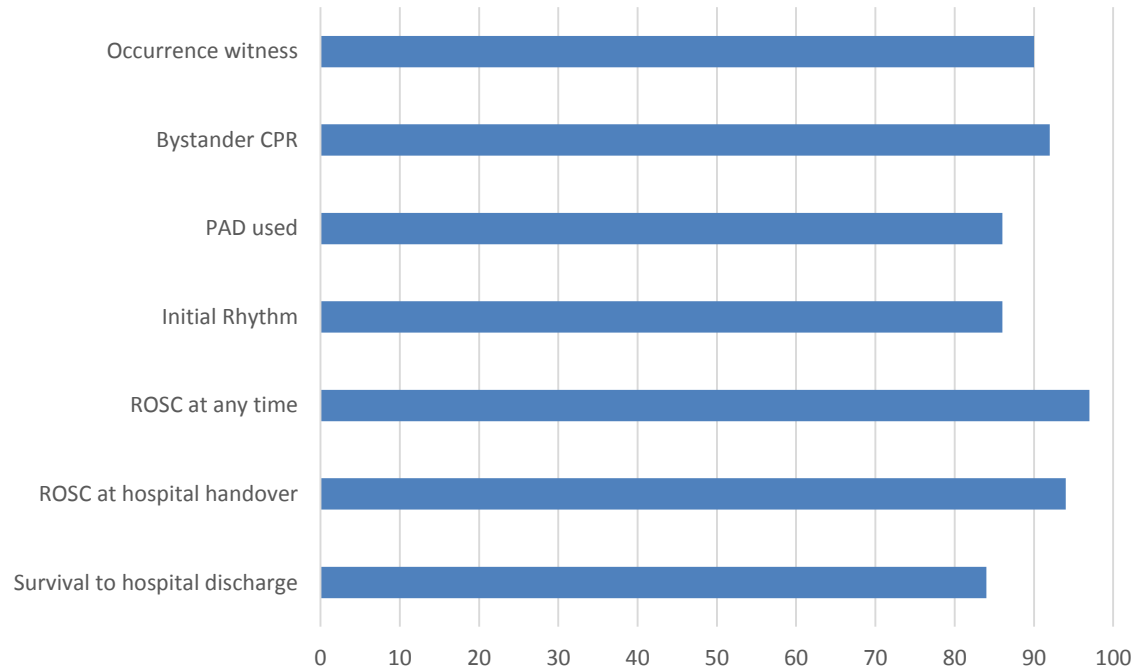
Number of resuscitation attempted cases
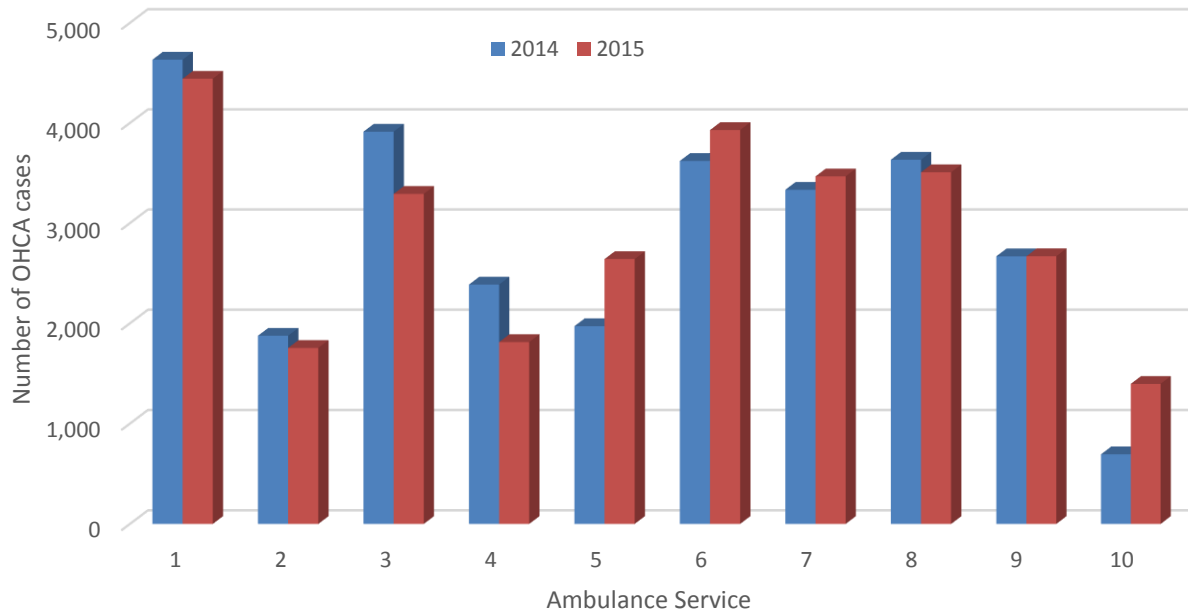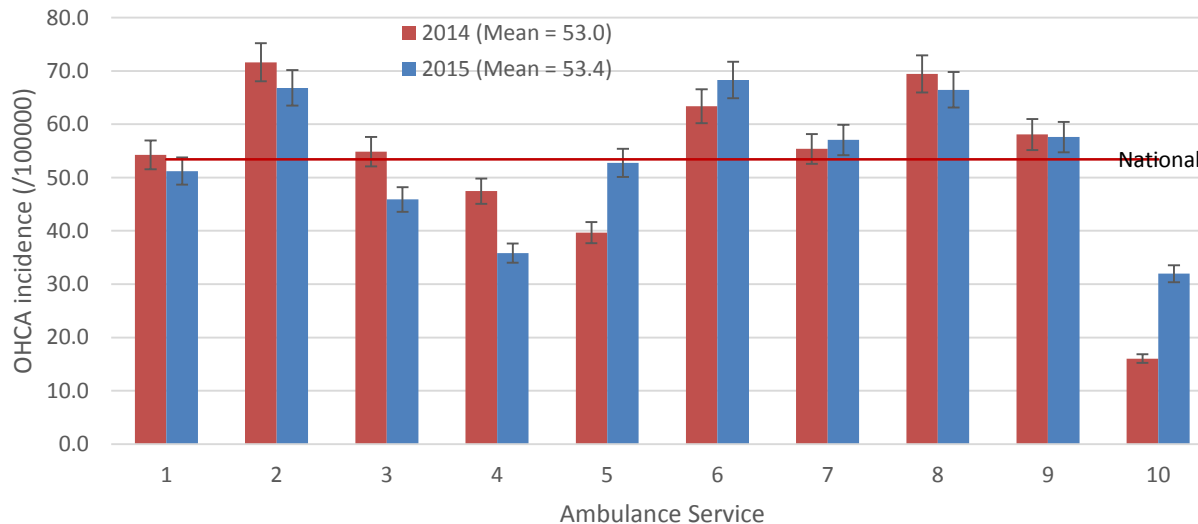
Incidence of OHCAs where resuscitation was attempted

Age/Sex distribution of EMS treated OHCAs
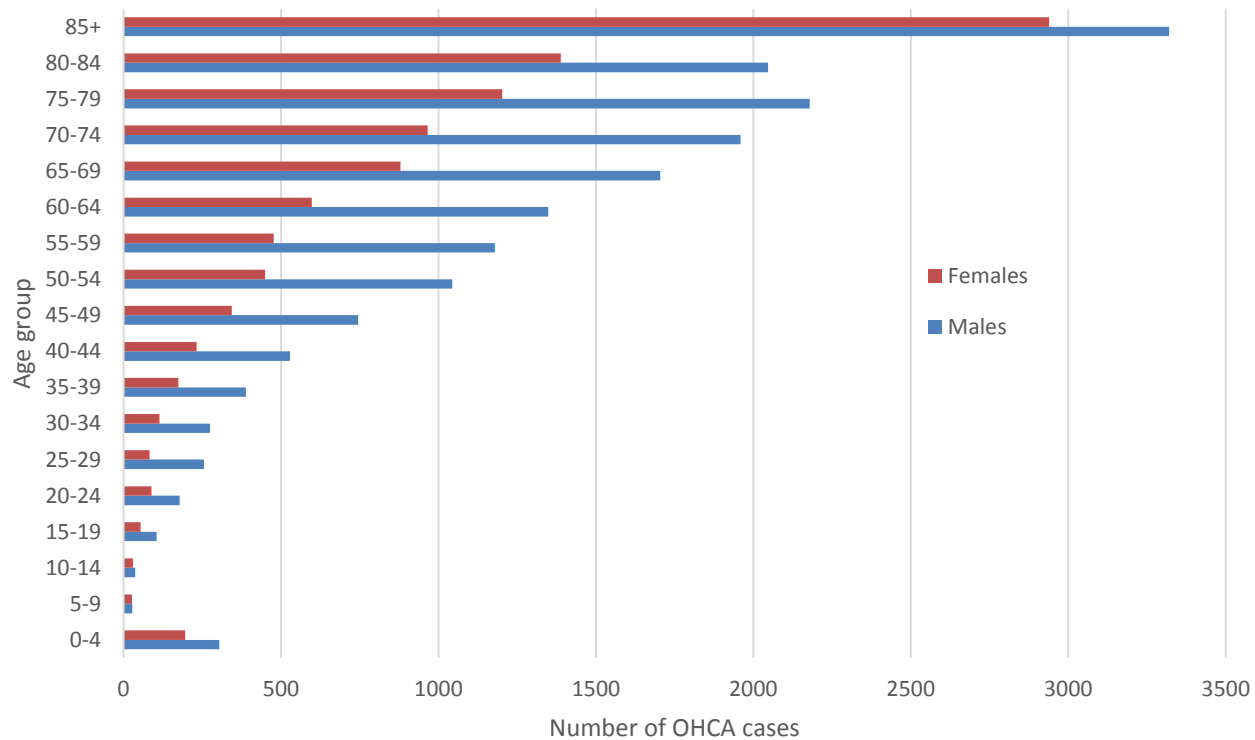
Age/Sex incidence of EMS treated OHCAs
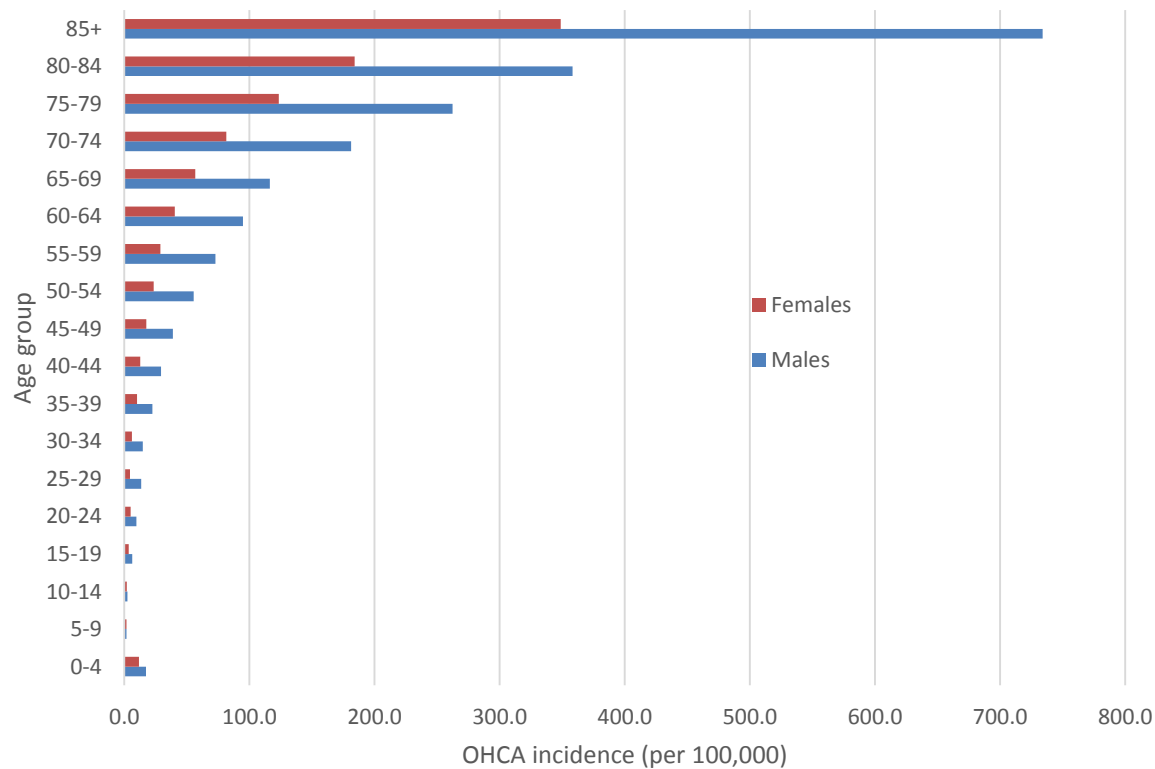
Location of OHCAs in the OHCAO registry
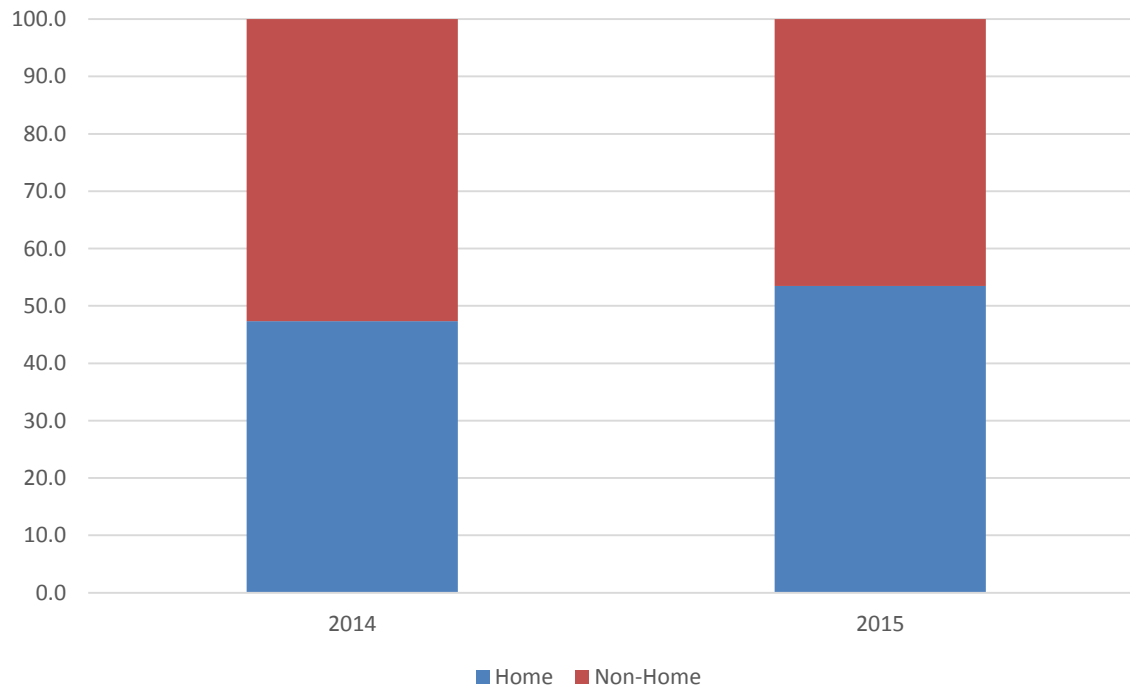
Initial aetiology of resuscitation attempted cardiac arrests
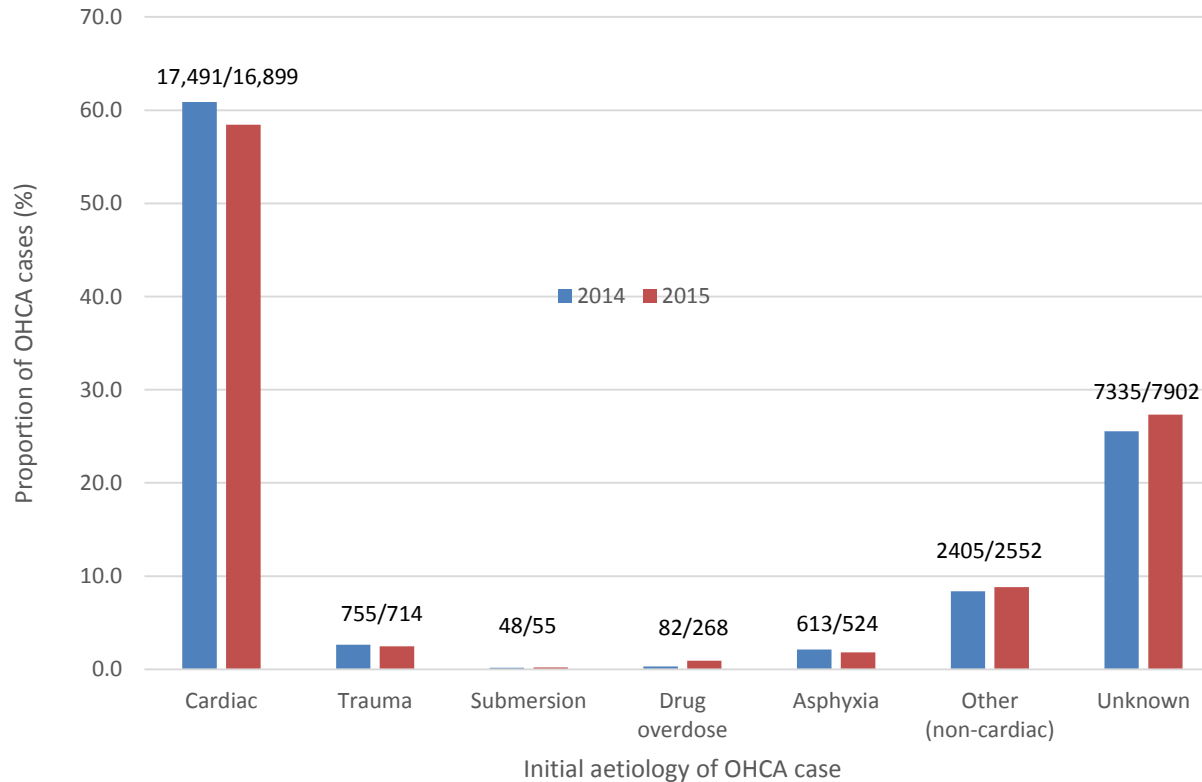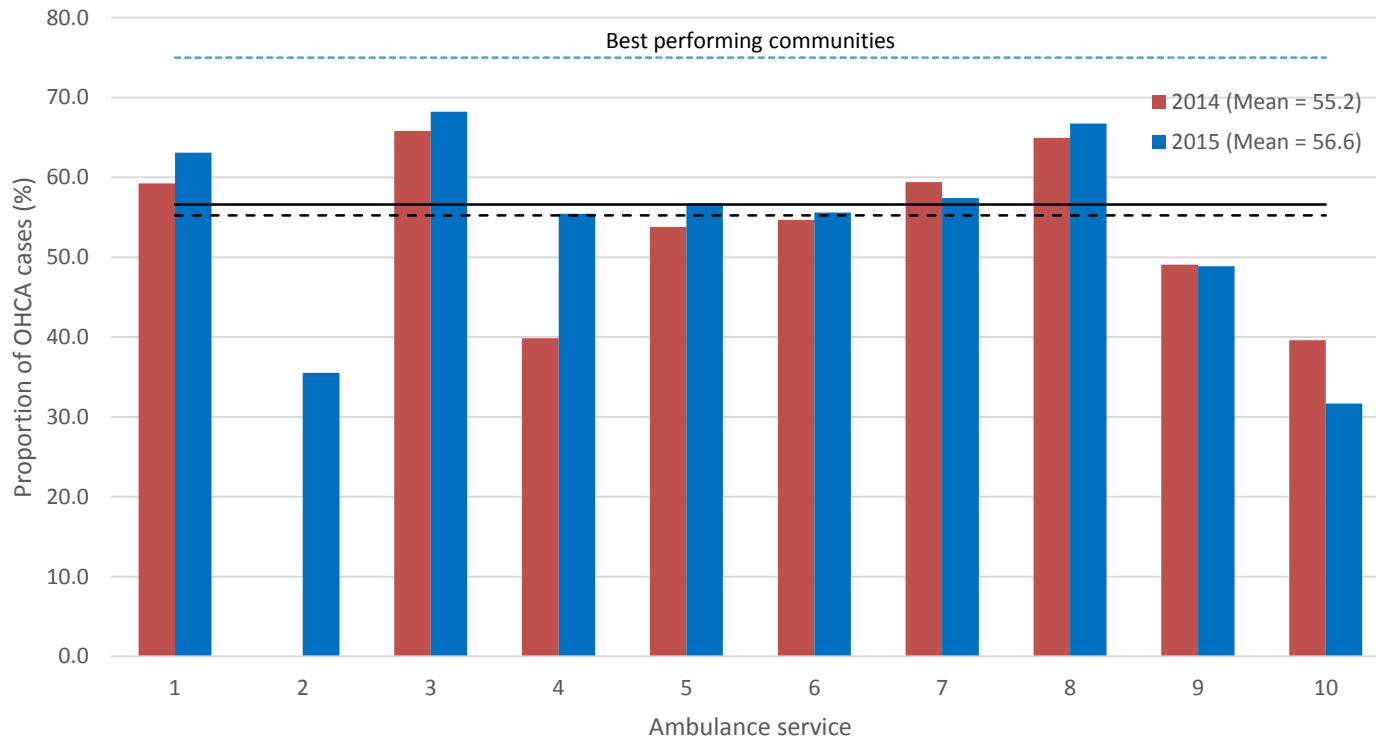
Witness status of OHCAs in registry
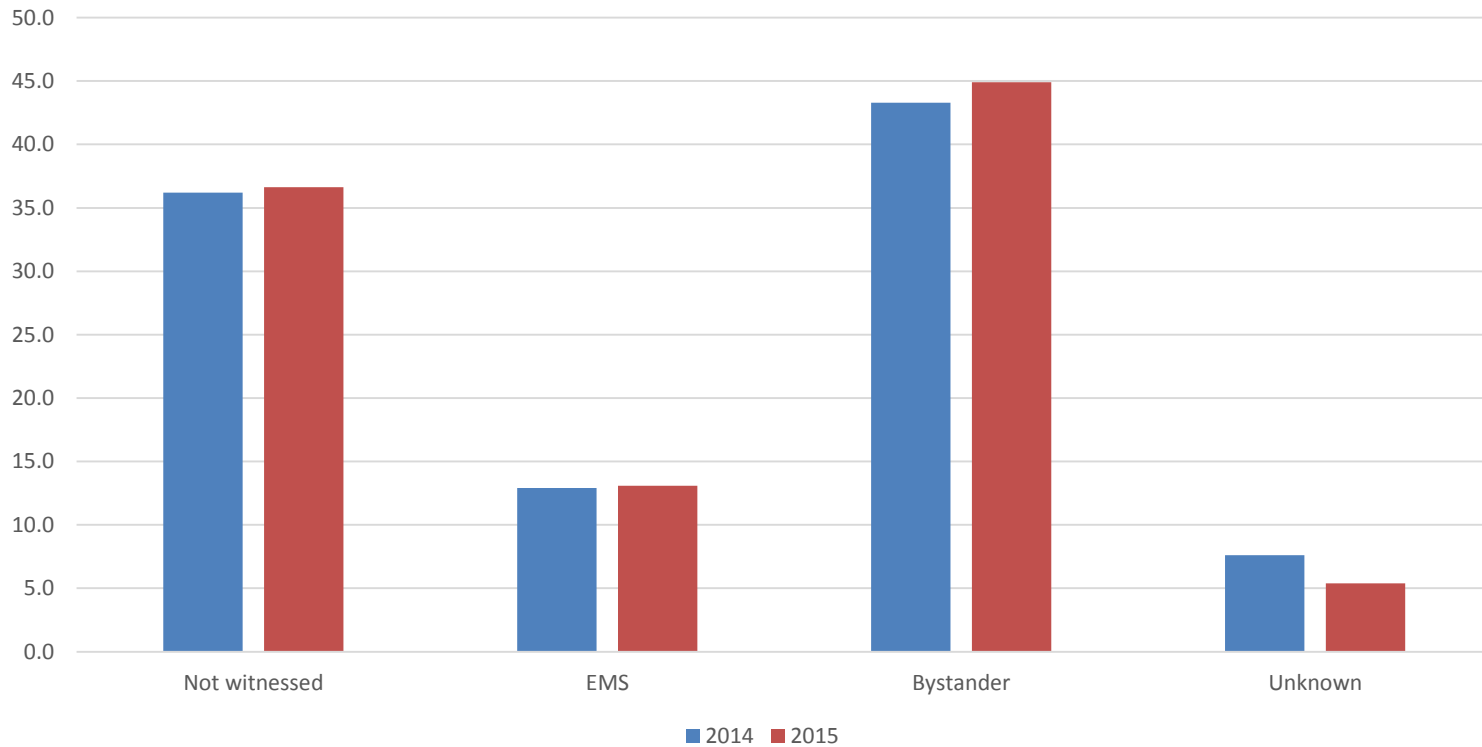
NB: Bystander category contains records where ambulance service indicated "Layperson" or "Yes"

Bystander CPR rate in non-EMS witnessed cardiac arrests
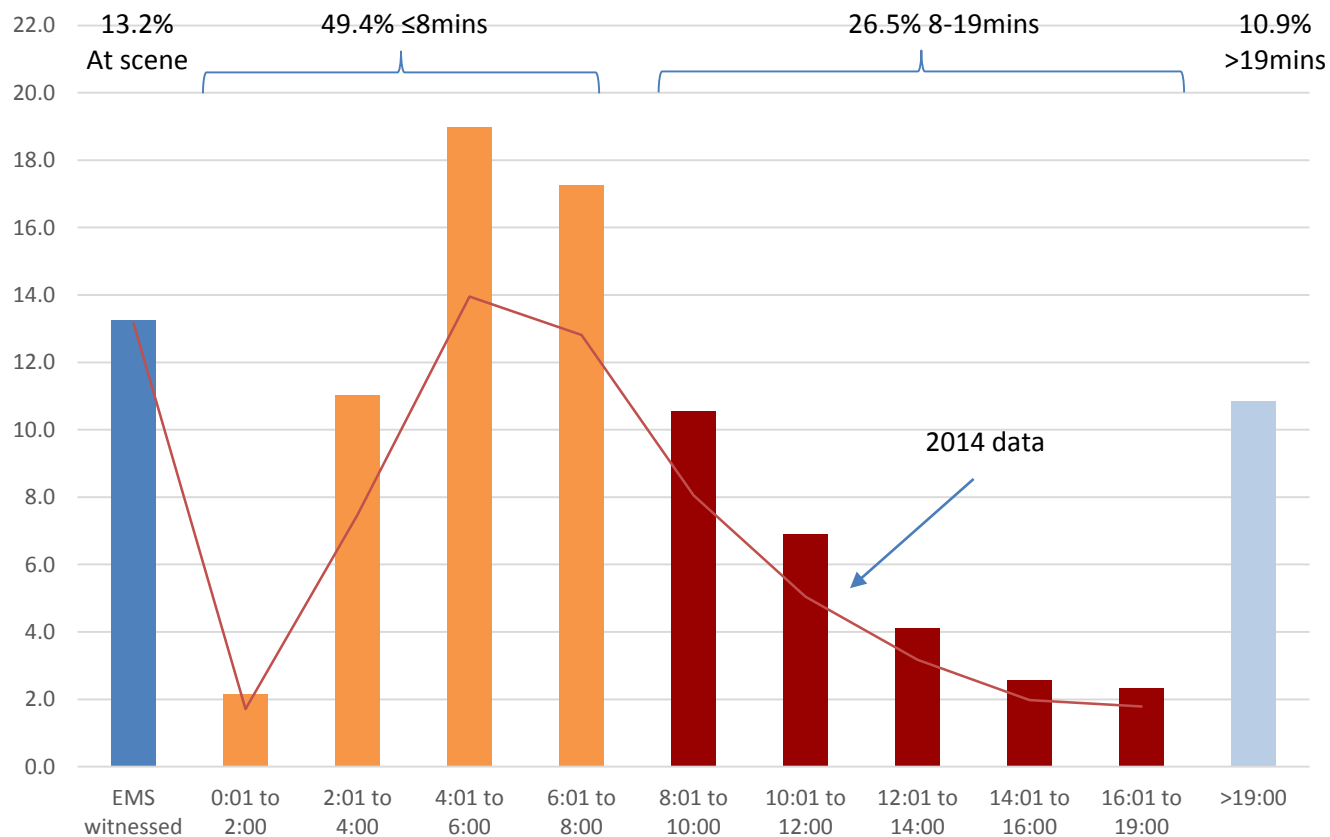

NB: Best performing communities are those from rest of world, e.g. Seattle, North Holland, Norway, Denmark, etc.
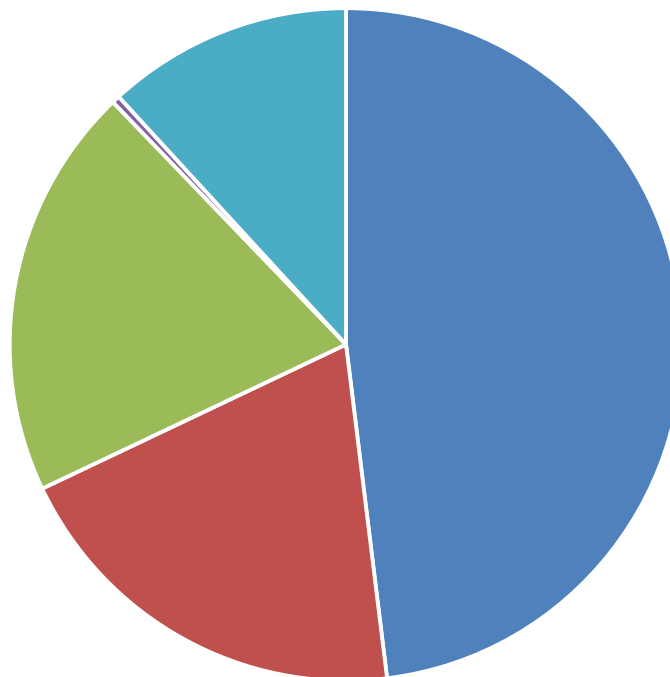
Arrival time of EMS to OHCA events

Initial rhythm of EMS treated OHCA events

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OHCAO

- Asystole (48.1%)
- VF/VT (19.9%)
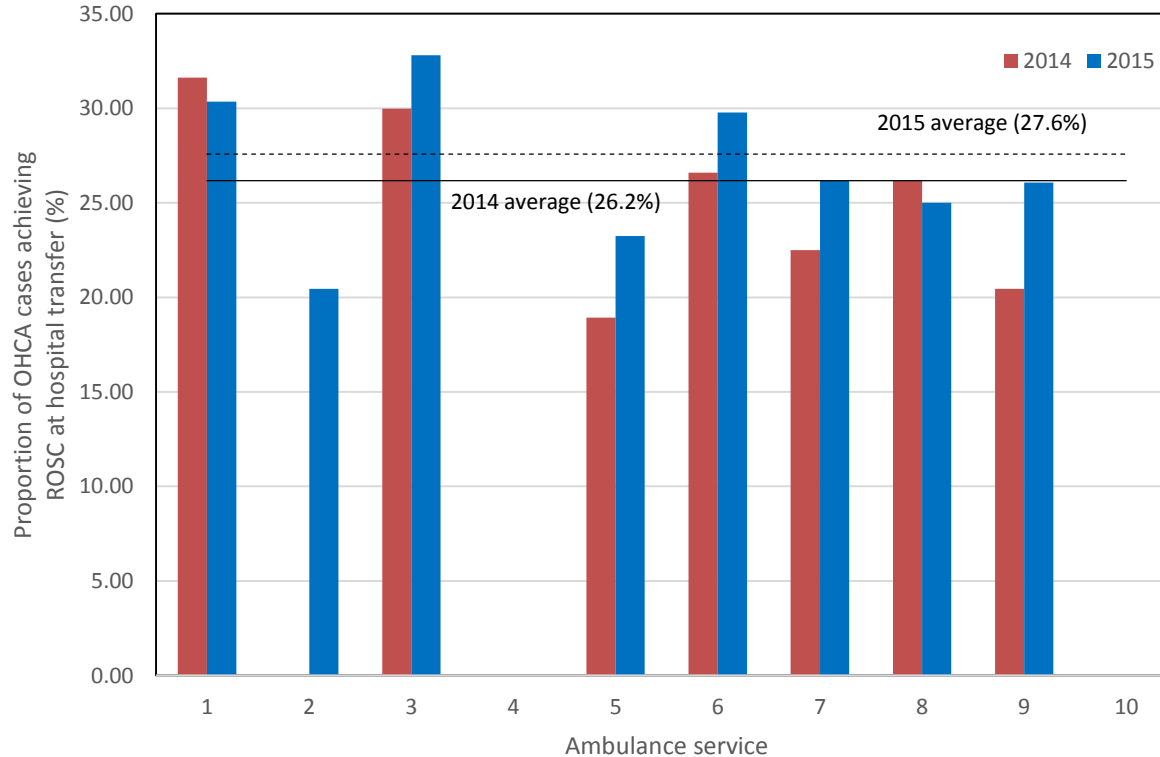- PEA (19.8%)
- Bradycardia (0.4%)
- Unknown (11.8%)

NB: Unknown category include "AED Non-Shockable"
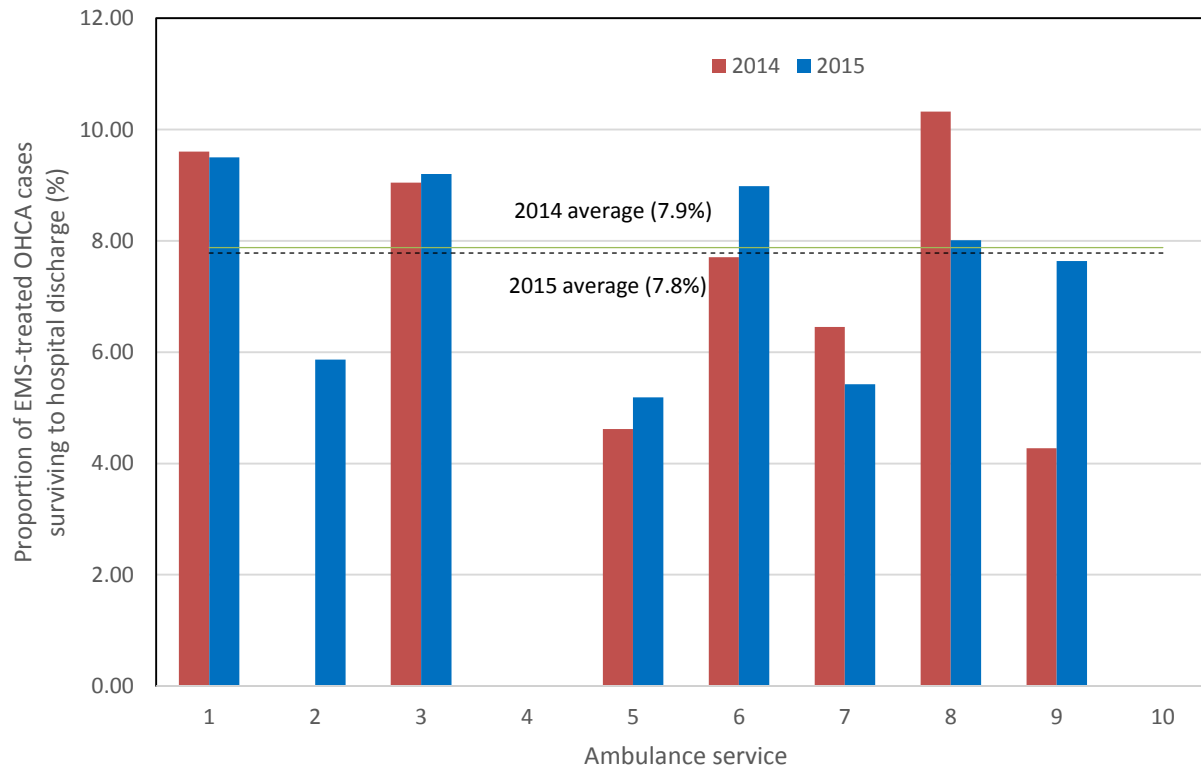
Rate of ROSC at hospital handover

Survival to hospital discharge in all EMS treated OHCAs

Survival from hospital handover to hospital discharge
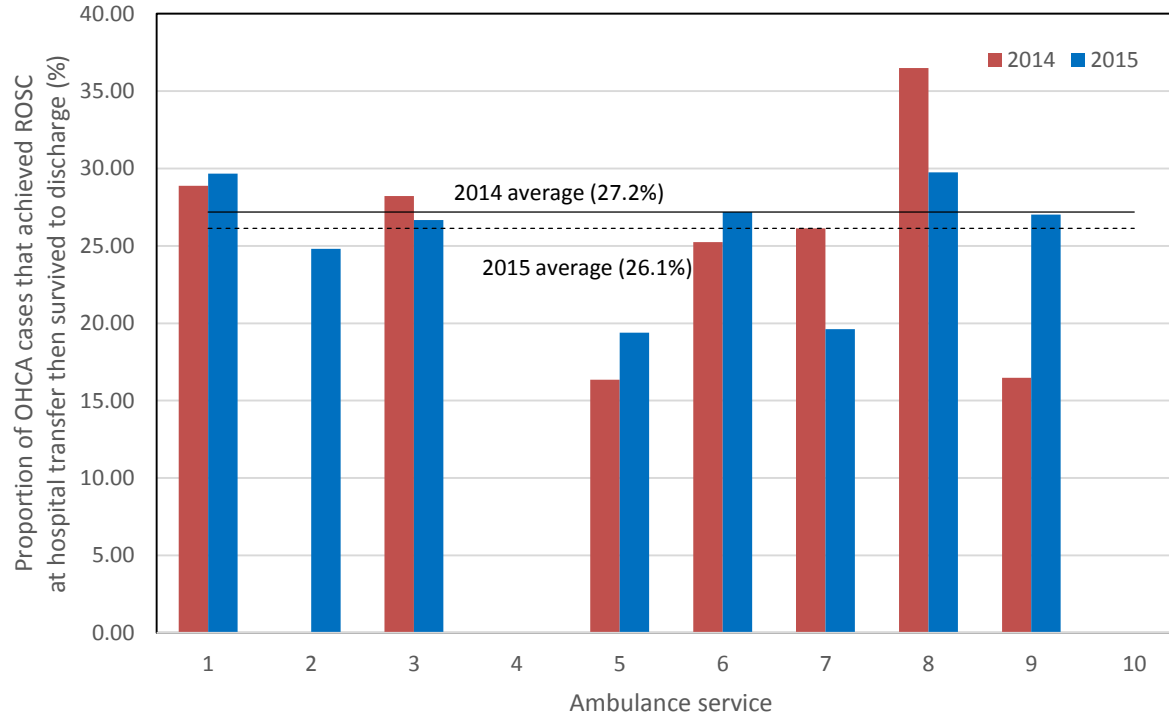
OHCAO Recommendations

· Review a selection of cases where cardiac arrest was not recognised at the time of the initial call. Establish any common themes and share with call operators.
· Are call operators familiar with the combination of unconsciousness and absence of normal breathing being the commonest signs of cardiac arrest?

· Review a selection of cases where cardiac arrest was identified during the call.
· Was telephone CPR instructions offered?
· Can you reduce the time from call to first compression?
· Did you contribute to European Restart a Heart day? Is there scope to increase contribution next year?
· Do you provide feedback on quality of CPR to crews?

· Have you mapped PADs in your community?
· Do you have a system which automatically alerts the call operator to the nearest PAD?
· What proportion of cardiac arrests were attended by a first responder?
Is there scope to increase the pool of first responders? (e.g. Police, GoodSam volunteers)

· What proportion of patients had an ECG after ROSC?
· Were patients with STEMI after ROSC taken to a PCI centre?
Do you provide feedback to call operators and crews on patient outcomes?