Out-of-Hospital Cardiac Arrest: Scotland's Challenge Gareth Clegg





Scottish Ambulance Service Taking Care to the Patient





Equitable access to a system of care producing an increase in neurologically intact survival to 15% of all worked arrests, for those where resuscitation is appropriate, with aftercare for all affected by OHCA in Scotland.



The Challenge of OHCA in Scotland

Percentage of 30 day survival for worked cardiac arrest patients



Scotland's Out of Hospital Cardiac Arrest Report 2019-22. <u>https://www.scottishambulance.com/publications/Out-of-Hospital-Cardiac-Arrest-Annual-Report</u>

The Challenge of OHCA in Scotland

Number of 30-day survivors and 30-day survivors per million for worked OHCA patients



Figure 10 shows the number of patients alive at 30 days after worked OHCA for the whole of Scotland between the years 2011-12 to 2021-12 (blue bars) and the number of 30-day survivors per million of the population (red line).

Scotland's Out of Hospital Cardiac Arrest Report 2019-22. https://www.scottishambulance.com/publications/Out-of-Hospital-Cardiac-Arrest-Annual-Report





The Utstein Formula for Survival

Generation of the Content of Con

—Jason Leitch



Chain of Survival





Essentially, all models are wrong, but some are useful. However, the approximate nature of the model must always be borne in mind...

-George Box









ALL LINKS ARE EQUAL BUT SOME LINKS ARE NORE EQUAL THAN OTHERS

to buy time

Early CPR

Lon recognition and call for

ont cardiac arrest





The importance of keeping left





Charles D. Deakin, *Resuscitation* 126 (1 May 2018): 80–82



Bystander CPR training improves survival

Figure 13 and 14: Relationship between Bystander CPR and OHCA survival in Denmark, 2001-2018





Where is the lifesaving potential in the Chain of Survival?



- Calling to activate chain of survival 1 minute earlier can increase survival by 10/M
- community CPR training triples with Telephone CPR)

- Combining community CPR training + telephone CPR programs will save most lives (impact of



The importance of keeping left







Scottish Government Riaghaltas na h-Alba

March 2021

Summary of the strategy aims

The top 10 aims of this strategy are that by 2026:

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- All school aged children in Scotland will have the opportunity to be equipped with CPR skills.
- We will target our work to address key inequalities in OHCA outcomes.
- Bystander CPR rates will be increased to 85%
- Public Access Defibrillators will be placed optimally and be as accessible as possible.
- 20% of all OHCAs will have a defibrillator applied before the arrival of ambulance service.
- Survival from OHCA will increase to 15%.
- All individuals who are affected by OHCA will be offered support afterwards.
- We will address the challenge of timely communication of anticipatory care plans and decision support for front line ambulance service crews.
- We will use data to understand and address variation and seek innovative ways to improve outcomes after OHCA.





Blacksmiths are unique in that they make their own tools

—Daniel Dennett





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CREATE A MOVEMENT



















Resuscitation Council UK

SAVE A LIFE FOR SCOTLAND





Figure shows the percentage of worked OHCA cases surviving to 30 days by SIMD 1 (dark red) and SIMD 5 (light red) from 2011/12 to 2018/19.





Available online at www.sciencedirect.com



journal homepage: www.elsevier.com/locate/resuscitation

Review

Association of measures of socioeconomic position with survival following out-of-hospital cardiac arrest: **A systematic review**

Rosemary C. Chamberlain^a, Calum Barnetson^b, Gareth R. Clegg^c, Nynke Halbesma^{a, c, *}

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Available online at www.sciencedirect.com



journal homepage: www.elsevier.com/locate/resuscitation-plus

Review

Incidence, characteristics and outcomes of out-of-hospital cardiac arrests in patients with psychiatric illness: A systematic review

Raied Alotaibi^{a,b,*}, Nynke Halbesma^a, Laura A.E. Bijman^a, Gareth Clegg^c, Daniel J. Smith^d, Caroline A. Jackson^a

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Resuscitation Plus







Relationship between Scottish Index of Multiple Deprivation and the density of suspected OHCA incidents



Scottish Index of Multiple Deprivation

Average number of suspected OHCA (09 coded calls) per square km per 9 months showing intermediate zones and figures based on OHCA incidents from 2011-2017



MEET PEOPLE WHERE THEY **GATHER TOGETHER**

LISTEN... SE INSPIKED B THEM



GYPSY / TRAVELLER COMMUNITY

- Barriers with access to health and social care services
- Discrimination and stigma
- Low health literacy and literacy
- Lack of trust in public services
- Over 6000 (known) Gypsy Travellers in Scotland although access to the National Census has been challenging for this group



find out more at savealife.scot







If someone has collapsed:



PUSH HERE PUSH HARD PUSH FAST

find out more at savealife.scot



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Survey of the local division of the local di







Scotland's Out of Hospital Cardiac Arrest Report 2019-22. https://www.scottishambulance.com/publications/Out-of-Hospital-Cardiac-Arrest-Annual-Report

Scotland's Out-of-Hospital Cardiac Arrest Report 2019-2022

Scottish Index of Multiple Deprivation (SIMD) and OHCA



Mystery rise in fatal cardiac arrests for the most affluent

Mark McLaughlin

Paramedics are investigating a mysterious marked rise in fatal cardiac arrests among affluent Scots since the start of the coronavirus pandemic.

Overall the survival rates among people who had a cardiac arrest outside of hospital improved dramatically in the years before the pandemic. However, the gains were reversed during social distancing and the strain on hospitals resulting from coronavirus.

Figures show only 8 per cent of patients from Scotland's most affluent neighbourhoods survived a cardiac arrest last year compared with 10 per cent from the poorest households.

The Scottish Ambulance Service (SAS) attempts to resuscitate approximately 3,000 cardiac arrest patients every year but only about 300 survive. Overall survival rates hit a record low in 2020-21 at the height of the pandemic when just 225 survived Rates

prived die in greater numbers than the covering. Two thirds of cardiac arrest victims received CPR from a bystander very rich. People in deprived areas are twice as last year, the highest since recording likely to suffer a cardiac arrest as the began in 2011-12.

most affluent. The SAS report states: "From 2011-12 to 2020-21, 30-day survival gap [between the very affluent and very deprived] was widening, however, this was not the case in 2021-22 as the gap narrowed. This may potentially indicate that concerted efforts by those involved in improving the system of care after out of hospital cardiac arrests are starting to bear fruit [for more deprived households].

"However, further analysis is required to understand the long-term significance of this apparent shift."

A cardiac arrest, when the heart stops beating and the victim falls unconscious, is distinct from a heart attack, where patients usually remain conscious but in pain. Survival rates declined dramatically denie alle a conservation and and a function

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WHAT PART WILL

YOU PLAV2

It takes a team to save a life.

#PlayYourPart

Become a lifesaver today at savealife.scot/play-your-part







SAVE A LIFE FOR SCOTLAND

#PlayYourPart

"This video reminded me of the most important thing which is that it takes a team to save a life! It made me feel valuable, not just for my physical abilities, but for my knowledge, and I think it's a very welcome reminder that we all have so much to contribute to teams!"

JESSICA Wheelchair User

Be a lifesaver. Accessible CPR resources at savealife.scot/play-your-part





Minimum Viable Product for CPR familiarisation

Study 1. Video script development

Crowdsourcing bystanders to OHCA

DEFIBRILLATOR

The Kore Ace at The Botanics

🔅 Fresh Bakes 🥸 Afterno

Available online at ScienceDirect

journal homepage: www.elsevier.com/locate/resuscitation

ILCOR Summary Statement

Optimizing outcomes after out-of-hospital cardiac arrest with innovative approaches to public-access defibrillation: A scientific statement from the International Liaison Committee on Resuscitation $\stackrel{\pprox}{\sim}$

Steven C. Brooks, Gareth R. Clegg, Janet Bray, Charles D. Deakin, Gavin D. Perkins, Mattias Ringh, Christopher M. Smith, Mark S. Link, Raina M. Merchant, Jaime Pezo-Morales, Michael Parr, Laurie J. Morrison, Tzong-Luen Wang, Rudolph W. Koster, Marcus E.H. Ong, on behalf of the International Liaison Committee on Resuscitation

Available online at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper Socioeconomically equitable public defibrillator placement using mathematical optimization

K.H. Benjamin Leung^{a,*}, Steven C. Brooks^b, Gareth R. Clegg^{c,d}, Timothy C.Y. Chan^{a,e}

^a Department of Mechanical and Industrial Engineering, University of Toronto, Toronto, ON, Canada ^b Department of Emergency Medicine, Queen's University, Kingston, ON, Canada ^c Resuscitation Research Group, The University of Edinburgh, Edinburgh, United Kingdom ^d Scottish Ambulance Service, Edinburgh, United Kingdom ^e Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, ON, Canada

The proportion of suspected OHCA incidents and existing AED **locations within each SIMD quintile**

SIMD Quintile

PAD deployment vs PAD use

number of PAD

Figure 28 shows the number of PAD registered and active on the national defibrillator network ('The Circuit') from August 2019 to March 2022. The red line shows the total number of PAD while the blue line shows the number of PAD available 24/7. The shaded red area shows the COVID-19 'lockdown' time period from the first day of lockdown in Scotland on 24th March 2020, to the move to level 3 restrictions on 20th April 2021.

proportion of OHCA near a PAD

Figure 31 shows the change in the proportion of worked OHCA occurring within 500 m (upper, yellow line), 200 m (middle, red line) and 100 m (lower, blue line) of a registered PAD in Scotland from August 2019 to March 2022. The shaded red area shows the COVID-19 'lockdown' time period from the first day of lockdown in Scotland on 24th March 2020, to the move to level 3 restrictions on 20th April 2021.

PAD deployment vs PAD use

Figure 33 shows the proportion of worked OHCA occurring within 100 m, 200 m and 500 m of a PAD where a PAD was actually used by a member of the public from April 2021 to March 2022. Within each distance category, the five coloured bars show the proportion for each of the five SIMD quintiles.

PADmap Logo

PADmap Logo

Home Search for PAD Locations About FAQs Contact

PAD instructions made it difficult to hear the call handler. Call handler instructions often did not match the situation. Different rates **Delay to starting compressions** All participants stopped performing compressions during the application of the PAD

Decreased success of defibrillation with increasing duration of pre-shock pause

Circulation (2002); vol 106; 368-72

Physiological and Emotional Response to PAD simulation

PR

Physiological Responses, Emotions & Stress in Simulated oUt-of-hospital Resuscitation Events

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