

British Heart Foundation Scotland submission of 24 May 2023

PE1989/F: Increase defibrillators in public spaces and workplaces

I'd like to take this opportunity to firstly thank the petitioner, Mary Montague, for bringing this important issue to the attention of the Petitions Committee and Members of the Scottish Parliament. Her journey to bring this petition forward is one that no one wishes to experience but unfortunately in Scotland is all too common.

Secondly I'd like to thank the Committee for the opportunity to contribute towards the discussion on public access defibrillators in Scotland, their provision and use in incidences of out-of-Hospital cardiac arrest (OHCA).

The British Heart Foundation is fully committed to helping improve survival rates from OHCA across Scotland, and the rest of the UK, through an evidenced based approach. We have worked, and are currently working, collaboratively with a wide range of partners including the Scottish Government, Scottish Ambulance Service and the Save a Life for Scotland partnership.

I hope the attached paper is helpful in the Committee's considerations of this petition and we would welcome any opportunity to discuss with the members of the Committee further.

David McColgan, Head of British Heart Foundation Scotland

BHF Scotland welcomes the consideration of this petition and supports all programmes to increase the number of defibrillators across Scotland. However, a number of issues exist in the current system of automated external defibrillator (AED) placement and consideration of this is crucial to the success of any programme.

[British Heart Foundation Public Access Defibrillator Programme](#)

The British Heart Foundation runs a scheme of part funded Public Access Defibrillatorsⁱ where, if a group meets a set of conditions, applicants are able to purchase a defibrillator at a cost of £600.

There are a number of conditions to secure a grant for a part funded defibrillator. To be eligible for a part funded defibrillator:

- The defibrillator must be kept outside in an unlocked and un-coded cabinet, where it can be accessed by anyone 24 hours a day.
- An electricity supply must be provided so that the defibrillator is kept at the right temperature in cold weather to prevent the battery and pads from damage.
- There must be a clear need for the device (e.g. a location with high footfall or in a rural area).
- There must be a commitment to train the local community in CPR using the BHF's [free online RevivR training](#).

Between 2017/18 and 2020/21, this scheme has part funded the purchase of more than 1,300 defibrillators across the UK, more than 300 defibrillators part funded in each year. In this time, applications increased from 545 in 2017 to a high of 918 in 2019/20.

However, due to the impact of the Covid-19 pandemic on the income of the British Heart Foundation, the programme was paused in 2021. These restrictions continued when the programme was reopened in 2022/23, which meant that only 99 applications were able to be approved from 333 applications.

Year	Number of applications	Number of approved applications
2017/18	545	332
2018/19	681	333
2019/20	918	358
2020/21	701	307
2021/22	0	0
2022/23	333	99

Table 1: Applications to the BHF part funded defibrillator programme¹

¹ Applications are approved based on meeting of criteria and variable financial constraints. More information about the criteria can be found [here](#)

The Circuit

The Circuit is a first-of-its-kind national defibrillator network that connects all defibrillators in the UK to a single network. Registering defibrillators on The Circuit allows ambulance services to quickly direct people to their nearest defibrillator.

The Circuit was developed by the British Heart Foundation, Microsoft, and the Scottish Ambulance Service, and co-funded by the Resuscitation Council UK and St John's Ambulance.

As of 2022, all 14 ambulance services across the UK have signed up to use The Circuit.

As of May 2023, there were around 6,400 defibrillators registered on The Circuit in Scotland, and more than 67,000 across the UK. A map of defibrillators registered on The Circuit can be found at defibfinder.uk.

The role of AEDs in improving outcomes from a cardiac arrest

Pollack, Brown et al showed in their 2018 paper *Impact of Bystander Automated External Defibrillator Use on Survival and Functional Outcomes in Shockable Observed Public Cardiac Arrests* that patients shocked by a bystander compared to those shocked by arriving EMS were:

- significantly more likely to survive to discharge (67% versus 43%)
- be discharged with a favourable function outcome (57% versus 33%).

Barriers to the purchase of AEDs

A wide array of reasons for not buying an AED can be found in academic literature including:

- 32-38% citing cost^{iiiiiv}
- 7-51% concerns about liability^{v2728}
- 24% never been considered²⁷
- 33% local EMS response was good enough²⁸
- 11% a hospital was nearby.²⁷

Maintenance and replacement plans have also been shown to be a barrier to accessibility of AEDs when an OHCA occurs. In one study 24% of AEDs were not maintained²⁵, 18% had no formal maintenance plans in place and 24% had no formal plan for replacement.²⁶

Placement of AEDs

A crucial aspect of the purchase of a defibrillator is its placement. It is widely held that the general approach to AED placement across the globe is failing. There are very few public programmes for the placement of AEDs and very little guidance available. Research has shown that most AEDs are placed by private citizens fundraising or charities supplying them^{vi,vii}.

There have been a number of studies, including the Stockholm Study^{viii}, which have shown that the current approach to AED placement does not correlate to the location in which OHCA's in public locations occur. This has led to an over-provision of AEDs in areas where fewer OHCA's occur, therefore reducing the impact of the AED footprint.

We know for example that the further the distance to an AED from the site of an OHCA, the less likely the AED is to be used and the lower 30-day-survival chances of the patient.

A big part of this is ensuring that AEDs are accessible to the public. One issue that prevents access is the issue of AEDs that are unavailable due to sites being closed during parts of the day. A 2017 study in Denmark of more than 12,00 OHCA's found that nearly 1 in 5 cardiac arrests occurred within the vicinity of an AED that was not accessible due to opening hours of its site^{ix}.

Government funding of AEDs in the community

Community defibrillator funds have been made available in other parts of the UK. For example, the Welsh Government launched a fund totalling £500,000 for community defibrillators in 2021^x, which has since been

increased to £1 million in 2022^{xi}. A similar fund was also introduced in England in 2022^{xii}.

Both programmes have a focus on ensuring that funded defibrillators are placed in areas of need and that all funded AEDs should be registered on The Circuit.

BHF Scotland would support a programme of support from the Scottish Government to increase the number of defibrillators in the community. It is crucial, however, that any such programme of defibrillator investment ensures that they are conditional upon placement being publicly accessible to maximise their effectiveness.

ⁱ <https://www.bhf.org.uk/how-you-can-help/how-to-save-a-life/defibrillators/apply-for-a-public-access-defibrillator>

ⁱⁱ Ashimi AO, Cobbe SM, Pell JP. Scottish survey of public place defibrillators. *Scott Med J* 2010;55:8–10.

ⁱⁱⁱ Bartimus HA, Rea TD, Eisenberg MS. Prevalence of automated external defibrillators at cardiac arrest high-risk sites. *Prehosp Emerg Care* 2004;8:280–283

^{iv} Coris EE, Sahebzamani F, Walz S, Ramirez AM. Automated external defibrillators in National Collegiate Athletic Association Division I Athletics. *Am J Sports Med* 2004;32:744–754.

^v Richardson LD, Gunnels MD, Groh WJ, Peberdy MA, Pennington S, Wilets I, Campbell V, Van Ottingham L, McBurnie MA, PAD Trial Investigators. Implementation of community-based public access defibrillation in the PAD trial. *Acad Emerg Med* 2005;12:688–697.

^{vi} Nielsen AM, Folke F, Lippert FK, Rasmussen LS. Use and benefits of public access defibrillation in a nationwide network. *Resuscitation* 2013;84:430–434.

^{vii} Cronin O, Jordan J, Quigley F, Molloy MG. Prepared for sudden cardiac arrest? A cross-sectional study of automated external defibrillators in amateur sport. *Br J Sports Med* 2013;47:1171–1174.

^{viii} Fredman D, Haas J, Ban Y, et al Use of a geographic information system to identify differences in automated external defibrillator installation in urban areas with similar incidence of public out-of-hospital cardiac arrest: a retrospective registry-based study *BMJ Open* 2017;7:e014801. doi: 10.1136/bmjopen-2016-014801

^{ix} Sondergaard KB, Hansen SM, Pallisgaard JL, Gerds TA, Wissenberg M, Karlsson L, et al. Out-of-Hospital Cardiac Arrest: Probability of Bystander Defibrillation relative to Distance to Nearest Automated External Defibrillator. *Resuscitation* 2017 Dec 4.

^x <https://www.gov.wales/we-are-committed-improving-community-access-defibrillators-boost-cardiac-arrest-survival-rates-vows>

^{xi} <https://www.gov.wales/new-funding-increase-defibrillator-access-wales>

^{xii} <https://www.gov.uk/government/news/number-of-defibrillators-to-be-increased-with-new-funding>