



Extended Research Article

Optimisation of the deployment of automated external defibrillators in public places in England

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Plain language summary

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Plain language summary

Ambulance services of the NHS treat over 32,000 people whose heart suddenly stops pumping effectively, a condition known as cardiac arrest. Despite ambulance services' best efforts fewer than 1 in 10 survive. Electric shock treatment, known as defibrillation, is one of the most effective treatments, and if it is given within a few minutes of the heart stopping, over half the people treated survive. It is now possible for public to use an automatic machine (defibrillator) to safely give an electric shock to the heart before the emergency services arrive. For the public to make best use of these machines they need to be in the right places.

In this study, we attempted to work out the best places to put defibrillators in communities, making them more accessible to use. We showed that defibrillators currently are sited disproportionately in more affluent areas of the country, and not used despite being within an accessible distance from where a cardiac arrest occurs. We assessed that if a defibrillator was installed at various points of interest the number of cardiac arrests that were covered increased significantly. We then used a computer to model the best locations for new defibrillators and calculate the optimal number needed. Placement based on this model showed that, for a smaller number of defibrillators, a similar improvement in coverage could be achieved.

A health economic analysis that considered the cost of purchasing and installing defibrillators showed that installing additional defibrillators in specific points of interest improved coverage, but it was also more costly compared to current defibrillator placement.

This research showed that significant improvement in cardiac arrest coverage could be achieved if defibrillators were placed intelligently in public settings. We also created a system that uses data to decide where to place public-access defibrillators in the community.

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