

# Community First Responders' role in the current and future rural health and care workforce: a mixed-methods study

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## Scientific summary

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## Scientific summary

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### Background

Community First Responders (CFRs) are trained lay (and sometimes health professional) volunteers dispatched by Emergency Medical Services (EMS) to potentially life-threatening emergencies such as cardiac arrest in the first vital minutes to provide care until ambulance staff arrive. CFR schemes were first introduced to support ambulance services to rural communities where access to prehospital emergency care is more likely to be delayed. Apart from a few small-scale evaluations, surveys and qualitative studies of CFRs, evidence is lacking for their contribution to rural EMS provision, how care is provided and how this might be improved. We sought to provide evidence for the contribution and costs of CFR schemes to rural healthcare delivery and outcomes and to identify ways that these services can be improved, innovated or developed further to benefit rural communities.

### Objectives

We aimed to investigate current activities, costs of provision and outcomes of CFR schemes, and explore views of patients, public, CFRs, CFR leads and primary care commissioners on CFRs, working with our stakeholders to develop recommendations for future innovations in rural CFR provision.

Our objectives were to:

1. Describe the contribution of CFRs to rural healthcare provision in terms of the numbers and timing of calls attended, together with the types of conditions and characteristics of people attended.
2. Evaluate the costs, funding sources and consequences [response time, out-of-hospital cardiac arrest (OHCA) outcomes, response to falls] of CFR schemes.
- 3a. Explore ambulance policies, guidelines and protocols for CFRs.
- 3b. Explore stakeholder (patients, relatives, ambulance staff, primary care, commissioners, CFRs and CFR scheme organisers) experiences and perceptions of CFRs' current role and the potential for future developments and innovations. We also aimed to ask CFRs and CFR scheme organisers about challenges in and solutions to recruiting, training and retaining CFRs in rural areas and how to ensure governance and accountability for safe, high-quality care.
4. Assimilate and integrate data derived from objectives 1–3, synthesising these to develop a list of recommendations for future innovations.
5. Prioritise recommendations for future developments/innovations in rural CFR provision through a consensus stakeholder workshop.

### Methods

We used a mixed-methods design, using a lens of pragmatism and the 'actor', 'behaviour change' and 'causal pathway' (ABC) framework to integrate quantitative (cross-sectional) and qualitative (policy,

guideline and protocol document together with stakeholder interview) data using the 'following the thread' approach to triangulation.

For the cross-sectional study of calls attended by CFRs, we used a retrospective observational study design, analysing routine electronic clinical records data from 6 of 10 regional ambulance services in England between 1 January 2019 and 31 December 2019.

For the survey of CFR costs and resource use, we used a bespoke self-administered questionnaire e-mailed to ambulance trust directors of research and heads of research requesting information on the workforce of volunteer CFRs, the budget allocated to CFRs and the actual expenditure for the financial years 2017–8, 2018–9 and 2019–20.

For the counterfactual analysis of the impact of CFR attendance on response times, we compared incidents that CFRs attended with those where ambulance staff attended in close geographical locations to derive response time distributions for each, adjusting by severity category and urban–rural classification, to estimate difference in attendance times and meeting of response target thresholds.

For the analysis of OHCA outcomes related to CFR attendance, we derived Utstein-style templates for cardiac arrest incidents presenting to East Midlands Ambulance Service attended by both CFRs and ambulance staff. We compared outcomes for return of spontaneous circulation (ROSC) and 30-day survival using multivariable regressions models comparing CFR arrival before EMS with EMS alone for both.

For the evaluation of the CFR response to falls provided by LIVES (Lincolnshire Integrated Voluntary Emergency Service), the falls response programme (FRP), introduced in Lincolnshire in 2019 and recommissioned after an initial pilot, we examined its operation, effects and cost-effectiveness during the period April 2020 to December 2021 using a cross-sectional design that linked falls episode data involving the programme from the ambulance service and the CFR scheme involved.

We identified potential innovations in CFR provision that were prioritised using a modified nominal group technique in a consensus meeting. Patients and public were involved throughout the study.

## Results

In 4.5 million incidents from six English regional ambulance services during 2019, pre COVID-19 pandemic, CFRs attended first a higher proportion of calls in rural areas (almost 4% of calls) than in urban areas (around 1.5% of calls).

Community First Responders attended first in more than 9% of category 1 calls and almost 5% of category 2 calls. They first attended 6.5% of the total number of neurological (e.g. loss of consciousness, convulsions, collapse) or endocrine (e.g. hypo- or hyperglycaemia) conditions and 5.9% of the total number of cardiorespiratory conditions (including breathing problems, chest pain and stroke). In a multivariable model, the main predictors of CFR attendance were rurality [odds ratio (OR) 2.05, 95% confidence interval (CI) 1.99 to 2.11;  $p < 0.001$ ]; cardiorespiratory conditions including such as breathing difficulty, chest pain and stroke (OR 9.20, 95% CI 5.08 to 16.64;  $p < 0.001$ ); and neurological conditions such as loss of consciousness and convulsions and endocrine conditions such as hypo- or hyperglycaemia (OR 9.26, 95% CI 5.12 to 16.77;  $p < 0.001$ ); and call categories 1 (OR 5.19, 95% CI 3.86 to 6.99;  $p < 0.001$ ) and 2 (OR 4.44, 95% CI 3.31 to 5.96;  $p < 0.001$ ) (the data in the sentence were first published in the conference abstract cited). They also attended lower-category calls for conditions such as falls. CFRs were less likely to attend patients from minority ethnic backgrounds, those from more deprived areas and those aged  $< 39$  years.

We examined 10 documents from seven ambulance services. Ambulance policies and protocols integrated CFRs into ambulance service structures to achieve the safe and effective operation of volunteers. Risks to CFR themselves, patients and the public, and the ambulance service were addressed through compliance with rules, standards and procedures, which varied between ambulance services.

The survey of resource use and costs showed that CFRs varied in number between 400 and 900 across ambulance services, but substantial numbers were active and available for duty. They were distributed in both rural and urban areas to different extents across different service regions. The average time on-call reported was 7 hours, with on average one shift per week provided. CFRs mostly operated alone, although in one trust two-fifths of CFRs operated in pairs. The costs of providing CFR schemes were incompletely recorded and reported by ambulance services, but reported figures varied considerably between ambulance services, around 20-fold from £40,000 to over £800,000 per year, so the true costs might have been even higher. The costs reported were attributed to staff providing management and training and the reimbursement of the out-of-pocket costs of volunteering, including fuel and vehicle use.

Community First Responders enabled a faster prehospital response time and facilitated the meeting of response time targets. When CFRs were dispatched, all but one of the eight 90th percentile thresholds were attained, whereas the ambulance response alone failed to meet the target in every instance but one. Apart from life-threatening category 1 emergencies occurring in urban areas, when an ambulance vehicle responded more quickly than a CFR, the results for all other combinations of severity and urban-rural location showed a time advantage in favour of CFRs.

There was no clear benefit in OHCA outcomes when a CFR attended first for either outcome of ROSC (OR 0.83,  $\beta$  coefficient  $-0.18$ , 95% CI  $-0.74$  to  $0.38$ ;  $p = 0.53$ ) or 30-day survival (OR 0.95,  $\beta$  coefficient  $-0.048$ , 95% CI  $-1.19$  to  $1.10$ ;  $p = 0.94$ ).

The CFR FRP reduced ambulance attendances. For the pilot period of 7 months, 445 falls patients were treated as per protocol by LIVES Lincoln CFRs using a fleet of two vehicles, averaging 31.8 patients per month per CFR team. For the recommissioned FRP service, over 21 months 1517 falls patients were treated as per protocol using three vehicles, averaging 24.1 patients per month per CFR team. The backup rate observed during the pilot was 68%, and for the recommissioned service this fell to 51.9%. Economic modelling suggests that the recommissioned service may be cost saving to the NHS.

We conducted semistructured interviews with 47 stakeholders engaged in CFR functions. This showed the trajectory of becoming a CFR, the CFR role, governance and practice, and the positive views of CFRs from stakeholders despite a lack of public understanding about their role. CFRs' scope of practice varied between ambulance services and had developed into new areas. Innovations prioritised at the consensus workshop were changed processes and structures and expanded scope of practice supported by training including counselling, peer support and hot debriefs, better communication with the control room, navigation and communication technology, and specific mandatory and standardised training for CFRs.

Missing routine data and small numbers of interviews in some stakeholder groups (patients, commissioners) were sources of bias.

## Conclusions

Community First Responders contribute to EMS delivery particularly in rural areas and especially for more urgent calls. The work of CFRs has expanded from its original purpose to attend OHCA, and it brings benefits in terms of response times, patient experience and the potential for CFRs to attend and

manage low-acuity incidents without an ambulance response, which could be cost saving for some interventions.

## Implications for service delivery

The findings suggest that CFR schemes provide benefits for EMS delivery, but the costs of provision need to be better identified. There are opportunities for CFR schemes to innovate, but implementation should be supported with additional resources including training and equipment.

## Recommendations for further research

Further research is needed to identify which innovations are taken up by CFR schemes and why, to evaluate the effectiveness and cost-effectiveness of CFR-related innovations, to explore the impact of the CFR role on individuals and communities, to understand how to motivate people to volunteer for CFR schemes, and how CFRs should be selected, trained and supported.

## Trial registration

This trial is registered as [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT04279262), NCT04279262.

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