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## Clinical paper

# Factors influencing support for the implementation of community-based out-of-hospital cardiac arrest interventions in high- and low-performing counties

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## Abstract

**Aim of the study:** Survival to hospital discharge from out-of-hospital cardiac arrest (OHCA) after receiving treatment from emergency medical services (EMS) is less than 10% in the United States. Community-focused interventions improve survival rates, but there is limited information on how to gain support for new interventions or program activities within these populations. Using data from the RANdomized Cluster Evaluation of Cardiac ARrest Systems (RACE-CARS) trial, we aimed to identify the factors influencing emergency response agencies' support in implementing an OHCA intervention.

**Methods:** North Carolina counties were stratified into high-performing or low-performing counties based on the county's cardiac arrest volume, percent of bystander-cardiopulmonary resuscitation (CPR) performed, patient survival to hospital discharge, cerebral performance in patients after cardiac arrest, and perceived engagement in the RACE-CARS project. We randomly selected 4 high-performing and 3 low-performing counties and conducted semi-structured qualitative interviews with emergency response stakeholders in each county.

**Results:** From 10/2021 to 02/2022, we completed 29 interviews across the 7 counties (EMS ( $n = 9$ ), telecommunications ( $n = 7$ ), fire/first responders ( $n = 7$ ), and hospital representatives ( $n = 6$ )). We identified three themes salient to community support for OHCA intervention: (1) initiating support at emergency response agencies; (2) obtaining support from emergency response agency staff (senior leadership and emergency response teams); and (3) and maintaining support. For each theme, we described similarities and differences by high- and low-performing county.

**Conclusions:** We identified techniques for supporting effective engagement of emergency response agencies in community-based interventions for OHCA improving survival rates. This work may inform future programs and initiatives around implementation of community-based interventions for OHCA.

**Keywords:** Out-of-hospital cardiac arrest (OHCA), Implementation science, First responders and medical professionals, Emergency medical services, Community-based interventions

## Introduction

In the United States, only 8–10% of individuals that experience out-of-hospital cardiac arrest (OHCA) survive to hospital discharge after receiving treatment from EMS.<sup>1–4</sup> There has been an effort to develop and implement new community interventions focused on improving OHCA outcomes, such as expanding comprehensive cardiopulmonary resuscitation (CPR) training for the general public and

medical professionals and increasing the efficiency of telecommunicator-assisted CPR over the phone by 911 telecommunicators.<sup>5–7</sup> These initiatives are associated with an increase in survival rates after an OHCA.<sup>7–10</sup>

While studies establish the efficacy of community interventions, there are limited resources on how best to implement OHCA interventions and programs in community settings. Specifically, guidance is needed on how to generate support for intervention activities within

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and across communities and emergency response agencies.<sup>11</sup> For example, a community education intervention launched in the Columbus/Franklin County, Ohio area utilized firefighters and other trained personnel for educating laypeople in hands-only CPR, but there is insufficient published description of how the research team engaged emergency service agencies to support the intervention activities.<sup>12</sup> No study has examined how to facilitate support, which is a key knowledge gap to promote and sustain the implementation of resuscitation interventions.

Details about how agencies were encouraged to participate are critical for successful implementation and sustainment in practice. Similarly, an observational study evaluated the effectiveness of a guideline-based telephone CPR care bundle to improve patient survival to hospital discharge and functional outcomes following an OHCA in metropolitan Phoenix, Arizona.<sup>13</sup> Although study data came from two public 9–1-1 emergency medical dispatch centers, 30 EMS agencies, and 22 cardiac receiving centers, few details are shared on what information or resources were given to the dispatch centers to facilitate their initial participation and then the adoption of the new CPR recommendations.<sup>13</sup> Thus, understanding support, engagement, and adoption for community-based OHCA interventions is key to improving outcomes from OHCA.

The purpose of this study is to identify factors impacting support from emergency response agencies when implementing an OHCA intervention.

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## Methods

In the context of a large, state-wide OHCA study, we conducted interviews with first responders and medical professionals to describe how support may differ. All qualitative implementation activities were approved by the Duke University Health System Institutional Review Board (Protocol ID: Pro00108506) and followed the Standards for Reporting Qualitative Research (SRQR) guidelines.<sup>14</sup>

### Defining support

Buy-in in healthcare settings can be defined as the act of agreeing to or accepting an idea.<sup>11</sup> This study considered support as an element of buy-in, which included verbal or physical support from key stakeholders for intervention activities.<sup>15</sup> Overall, available literature widely suggests that obtaining support from key informants is a critical step in the success of a new health-related intervention as it can mitigate implementation challenges.<sup>11,15–18</sup>

### RACE-CARS intervention

The data for this study are captured in the context of the RAndomized Cluster Evaluation of Cardiac ARrest Systems (RACE-CARS) trial. RACE-CARS is a 7-year pragmatic, cluster randomized trial focused on 62 counties within North Carolina (NC), with an overall goal of evaluating the effect of a strategic community-based OHCA intervention on survival with good neurological function. RACE-CARS consists of four interventions: (1) comprehensive community training of lay people in CPR and automated external defibrillator (AED) use, (2) improved medical 911 telecommunicator performance focused on enhanced (accelerated) recognition of possible cardiac arrest, (3) enhanced bystander initiation of CPR with 911-telephone coaching, and (4) improved first responder performance to achieve earlier defibrillation with AEDs.

### Guiding framework

We used the Consolidated Framework for Implementation Research (CFIR) to guide qualitative work for the RACE-CARS study.<sup>19,20</sup> We focused on 10 CFIR constructs (Relative Advantage, Adaptability, Complexity, Implementation Climate, Readiness for Implementation, Available Resources, Access to Knowledge & Information, Knowledge & Beliefs about the Intervention, Self-efficacy, and Planning) across all 5 domains (Innovation, Outer Setting, Inner Setting, Individuals, and Implementation Process). We used CFIR to inform data collection (e.g., interview guide, structured notetaking template), analysis, and interpretation.

### Sampling frame

We stratified the 62 NC counties into high-performing and low-performing counties to obtain a diverse sample. Counties were evaluated on their performance using Cardiac Arrest Registry to Enhance Survival (CARES) data.<sup>21</sup> First, NC counties were ranked by the RACE-CARS study team based on the county's cardiac arrest volume, percent of bystander-CPR performed, patient survival to hospital discharge, cerebral performance in patients after cardiac arrest, and perceived engagement in the RACE-CARS project. A RACE-CARS study coordinator determined perceived engagement in the RACE-CARS study based upon extensive prior work with NC EMS agencies, 9-1-1 centers, and hospitals. This process provided the team with a ranked list, and from that list, we divided the list into 10 high and 10 low-performing counties. The implementation team randomly selected 4 high-performing counties ( $n = 15$  interviews) and 3 low-performing ( $n = 14$  interviews) counties to interview.

### Sample

We identified four key informant groups to interview: EMS, telecommunicators, fire/first responders, and hospital representatives. We sampled these individuals because RACE-CARS is a community-based intervention focused on targeting these groups to improve survival rates after an OHCA. We aimed to interview individuals from various roles within each key informant group, including senior directors to entry-level staff workers.

The RACE-CARS study coordinator assisted in recruitment due to their long-standing relationships with stakeholders. First, the study coordinator identified participants for an interview and sent potential interviewees an initial recruitment email with details about the purpose of the interviews. This email included a statement that a member of the implementation team would contact the interviewee within two weeks to obtain the interviewee's interest in completing the interview and scheduling an interview if desired. In the follow-up email, the implementation team member confirmed participant eligibility, assessed interest in participating, and scheduled the interview as appropriate. The RACE-CARS study coordinator helped facilitate connections with interviewees and gauge interest in participating if the implementation team did not receive a response. Verbal consent was obtained at the time of the interview for participants who were interested and able to participate.

### Data collection

The interview guide focused on three topics: (1) county and community-based characteristics (EMS resources, culture, and context) associated with the adoption of interventions to improve CPR and early defibrillation, (2) interventions associated with increased reach, adoption, implementation, and maintenance of higher rates

of CPR and early defibrillation, and (3) approaches that were more or less successful in key subgroups (e.g., Black individuals and women). We used probes (e.g., “What challenges, if any, have you encountered in the past when implementing new programs or interventions?” and “Based on your past training/coaching experience in general, what may make implementation of our trial’s intervention strategy easier overall?”) to elicit further clarification and additional description. The one-time, semi-structured qualitative interviews were audio-recorded and completed via videoconferencing or telephone. Interviews were conducted by an interviewer and a notetaker who took notes using a structured notes template. After each interview, the interviewer and notetaker debriefed to discuss emerging similarities and differences in these data. Members of the interview team had diverse racial identities, all self-identified as women, and had a background in implementation and clinical research. Additionally, the interview team included an Emergency Medical Technician-Basic (EMT-B).

### **Focused data analysis**

We employed team-based, rapid qualitative analysis to analyze these data to share results quickly with the larger RACE-CARS team.<sup>22</sup> Although the interviews were audio-recorded, data from the structured notetaking forms and debrief forms were entered into a Microsoft Excel document. The Excel document was organized with interview questions in columns and participant responses in rows. We focused our analysis on the *Inner Setting* domain, to provide timely contextual information, and evaluate support to inform the RACE-CARS study. Two implementation team staff summarized responses for each question across participants and then created a general summary for each interview question. We then analyzed summaries in aggregate and then by high- and low-performing counties to identify themes salient to intervention support. We ensured the rigor and validity by conducting independent coding and summarization of all data; presenting interim findings to several members of the RACE-CARS study (primary investigator, study coordinator, co-investigator); holding implementation team meetings to discuss emerging themes; and reviewing our findings with the larger study team.

## **Results**

### **Overview**

Interviews occurred between October 5, 2021, to February 17, 2022. We invited 32 individuals, and of those, 29 individuals agreed to be interviewed. Interviewees came from the 7 counties we prioritized, and the sample was balanced between high ( $n = 15$ ) and low ( $n = 14$ ) counties. The following groups completed interviews: EMS ( $n = 9$ ), Telecommunicators ( $n = 7$ ), Fire/First Responders ( $n = 7$ ), and Hospital Representatives ( $n = 6$ ) (Table 1). Interviews lasted between 23 minutes and 121 minutes, with the average being 51 minutes.

We described findings salient to intervention support across three themes: (1) initiating support at emergency response agencies; (2) obtaining support from emergency response agency staff (senior leadership and emergency response teams); and (3) and maintaining support. For each theme, we described similarities and differences (Table 2) and provided illustrative quotes (Table 3) by theme.

### **Initiating support at emergency response agencies**

#### *Similarities across high- and low-performing counties*

Participants from high- and low-performing counties emphasized the importance of the initial delivery and presentation when a study team is trying to obtain support for a new community-based OHCA intervention at medical or first responder agencies. Participants suggested being creative by incorporating humor, using positive remarks, providing data, and discussing the rationale for new changes or interventions about OHCA. In addition, using a content expert (e.g., a cardiologist, nurse, or study coordinator) that is a part of the study team to introduce a new community-based OHCA intervention to key decision-makers could also be beneficial in obtaining initial support.

#### *Differences across high- and low-performing counties*

High-performing county participants underscored the importance of clearly stating the benefits to employees and improvement in patient outcomes at the introductory meetings. High-performing county participants stated that reinforcing these two aspects would positively impact support.

Low-performing county participants stated that emergency response agencies and team members might resist any new changes and that study leaders should work to address this resistance by holding meetings with stakeholders to build foundational relationships. Participants stated that having a connection with the emergency response agencies through these newly built relationships may help generate support. The introductory meetings could be one-on-one or with a group of essential personnel. Participants claimed that people started to show support in favor of the new intervention with repeated exposure to the intervention.

### **Obtaining support from emergency response agency staff (from senior leadership)**

We did not identify any similarities in obtaining support from senior leadership across high- and low-performing counties.

#### *Differences across high- and low-performing counties*

Participants from high-performing counties acknowledged that they usually have support from individuals in senior positions due to their history of successful implementation of new changes or interventions.

However, consistent presentations and meetings with higher-ups (e.g., supervisors, managers, captains, chiefs, and directors in emergency response agencies) over an extended period of time helped establish support in high-performing counties. It was also critical that communication with higher-up emergency responders in high-performing counties included an in-depth discussion about financial and grant planning for the intervention.

High-performing county participants also mentioned potential barriers to successful administrative support, including (1) needing approval from multiple people, especially if the emergency responders work in a hospital-based system, (2) inability to collaborate with health departments, and (3) financial challenges.

While participants from low-performing counties were not specific about strategies to implement support with senior or administrative providers in emergency response agencies, they did indicate that agency leaders needed to set a positive and collaborative attitude in order to generate support from teams.

**Table 1 – Participant demographics (n = 29).**

	High-performing counties (n = 4)	Low-performing counties (n = 3)
<b>Agency Affiliation</b>		
Emergency Medical Services (n = 9)	4	5
Telecommunicators (n = 7)	4	3
Fire/First Responders (n = 7)	4	3
Hospital Representatives (n = 6)	3	3
<b>Area Agency Services</b>		
Urban (n = 4)	3	1
Rural (n = 3)	1	2
<b>Role</b>		
Senior Leadership (n = 11)	5	6
Emergency Response Team Personnel (n = 18)	10	8

### **Obtaining support from emergency response agency staff (from emergency response teams)**

#### *Similarities across high- and low-performing counties*

Both sample populations noted that maintaining simplicity when explaining the intervention increases the acceptance of a new initiative in emergency response agency teams. For instance, individuals that created or presented content to agency staff teams should refrain from using overly technical and specific language when sharing details about the intervention unless requested by a team member.

Similarly, ensuring that team members clearly understand their role to assist in implementing the intervention before launching the intervention was identified as an effective method of getting team members to support new changes and achieve intervention goals.

Participants from high- and low-performing counties expressed that although every team was different, gathering support from team members required training and education of all personnel implementing the changes, an outlet for frequent communication about the intervention, and easily accessible detailed explanations about the intervention at the minimum.

We did not identify any differences in obtaining support from emergency response teams across both sample populations.

### **Maintaining support**

#### *Similarities across high- and low-performing counties*

After emergency response agencies endorsed the intervention, participants from both high- and low-performing counties stated that individuals trying to implement the new intervention needed to provide regular updates to the emergency response agencies to maintain the support. These updates should contain data showing positive outcomes from the changes, such as data showing increased patient survival rates. Some participants said they would like to see anecdotal data showing improvement in patient outcomes.

#### *Differences across high- and low-performing counties*

In addition, participants from high-performing counties provided two additional methods to maintain support. First, preserving the support from teams or crews was key. Secondly, a consistent and efficient feedback mechanism was needed between the intervention study team and emergency responders in order to make beneficial adjustments to the intervention delivery when necessary.

In contrast, participants from low-performing counties only mentioned clear communication and follow-ups as an additional method

for acceptance in agencies to be maintained once support is achieved and the changes are being implemented.

## **Discussion**

We identified different strategies that can be used to gain support from emergency response agencies to support a new OHCA intervention. Although high- and low-performing counties differed in their percentages of cardiac arrest calls, bystander-CPR performed, patients surviving to hospital discharge, cerebral performance in patients after cardiac arrest, and perceived engagement in the RACE-CARS project, qualitative findings from both populations suggested similar techniques. These techniques included (1) using innovative methods to describe the importance of the new intervention, (2) consistently meeting with essential stakeholders to discuss the intervention over the span of a few months or years, (3) sharing relevant data that demonstrates the benefit of the intervention, (4) communicating frequently and training key personnel that will be administering the new changes, and (5) creating opportunities for stakeholders to provide feedback.

Additionally, participants from high- and low-performing counties stressed the need to see periodic reports demonstrating positive patient outcomes to maintain their support. However, if an intervention is implemented across high- and low-performing counties, it may be necessary to consider the success metrics of each sample group independently. For example, this study associated high-performing counties with a higher volume of OHCA calls because emergency responders were more likely to have more practice and familiarity with OHCA treatment plans. Prior research shows that response centers and emergency departments that responded to a higher volume of OHCA are associated with improved survival and neurological outcomes compared to emergency response units with a lower volume of OHCA calls.<sup>23–25</sup> Thus, a high-performing county could see a faster and more positive increase in patient outcomes after implementing a community-based intervention compared to a low-performing county. This difference may dissuade low-performing county emergency responders from continuing to support new changes because their metrics are not improving as significantly as other counties. Additional research is needed to make further conclusions, but data shared back to an emergency response unit should either include results for that particular unit or specify county-specific details that explain the discrepancy in performance.

**Table 2 – Summary of findings to initiate and maintain support with emergency response agencies.**

		Initiating Support at Agencies	Obtaining Support from Agency Staff	Maintaining Support	
			Obtaining Support form Senior Leadership	Obtaining Support form Emergency Response Teams	
Similarities	Across high- and low-performing counties	<ul style="list-style-type: none"> <li>– Be creative when presenting the rationale for new changes or a new intervention</li> <li>– Introduce the intervention or changes by someone who is very familiar with or has experience with the intervention</li> </ul>	<ul style="list-style-type: none"> <li>– No strategies were identified across both sample populations</li> </ul>	<ul style="list-style-type: none"> <li>– Maintain simplicity when explaining the intervention</li> <li>– Ensure that team members clearly understand their role in assisting in implementing the intervention before launching the intervention</li> <li>– Train and educate all personnel that will be implementing the changes</li> <li>– Create an outlet for frequent communication about the intervention</li> <li>– Develop easily accessible detailed explanations of the intervention</li> </ul>	<ul style="list-style-type: none"> <li>– Provide regular updates to the emergency response agencies, including quantitative and anecdotal data that shows patient outcome improvement</li> </ul>
Differences	High-performing counties	<ul style="list-style-type: none"> <li>– Reinforce the benefits to employees and patient outcomes</li> </ul>	<p>Counties typically have support from individuals in senior positions due to their history of successful implementation, but some strategies include:</p> <ul style="list-style-type: none"> <li>– Hold consistent presentations and meetings over an extended period</li> <li>– Share extensive details about financial and grant planning for the intervention</li> </ul> <p>Potential barriers include (1) needing approval from multiple people, especially if the emergency responders work in a hospital-based system, (2) the inability to collaborate with health departments, and (3) financial challenges.</p>	<ul style="list-style-type: none"> <li>– No differences in strategies were identified across both sample populations</li> </ul>	<ul style="list-style-type: none"> <li>– Preserve the support from teams or crews</li> <li>– Establish a consistent and efficient feedback mechanism</li> </ul>
	Low-performing counties	<p>There is initial resistance to changes or new interventions, but one strategy was identified:</p> <ul style="list-style-type: none"> <li>– Hold meetings with stakeholders, either as a group or one on one, to build foundational relationships</li> </ul>	<ul style="list-style-type: none"> <li>– Agency leaders need to set a positive and collaborative attitude in order to generate support from teams</li> </ul>	<ul style="list-style-type: none"> <li>– No differences in strategies were identified across both sample populations</li> </ul>	<ul style="list-style-type: none"> <li>– Communicate clearly with agencies</li> <li>– Follow-up about the intervention as needed</li> </ul>

**Table 3 – Quotations from Qualitative Interviews.**

	Initiating Support at Agencies	Obtaining Support form Senior Leadership	Obtaining Support form Emergency Response Teams	Initiating Support at Agencies
Similarities	<p>“[Have] as much data as possible of how is this working. It’s pamphlets, or maybe a little video, or somebody that is extremely experienced. The biggest thing is somebody that’s extremely experienced with the program delivering that information. Like I’m not experienced with the program so I wouldn’t be very good at delivering that to my people. But somebody that knows the ins and outs, and that whether it’s a little video that can hit every aspect of it, or even if it happens to be something where they come in person, then they could answer questions if there are questions involved. I think all of that would be great.” – <b>Fire Rescue Division Chief in a low-performing county</b></p> <p>“I equate [our lack of issues with support] to social media in its early stages. It’s all about delivery, who’s selling it, who’s selling the product. That would make a big difference. If you’ve got your medical responders that are selling it, then people will buy into it.” – <b>Fire Chief in a high-performing county</b></p>	<p>No notable quotations were identified.</p>	<p>“If you can, keep an intervention simple because we already have enough stuff we have to worry about. And especially now with COVID, everybody is overworked, everybody is overtired. If it’s a solution that they can, even if they can just perceive that it’s making their life easier, they’re going to buy it. All day long.” – <b>Clinical Improvement Analyst (Emergency Medical Services / Medic) in a high-performing county</b></p> <p>“We implement change all the time . . . change is not new to us, it’s just a matter of making sure we walk through those steps to make sure everybody is comfortable.” – <b>Fire Chief in a high-performing county</b></p> <p>“I’ve got guys that have spent their entire careers in the fire service that’s never run medical calls, so they’ve been a little reluctant. And I’ll be honest, it can be a little scary. Because now you’re not putting water on fire, you’re putting hands on people, and their lives depend on that. So, it’s just getting over that change [and] working through that education piece to make sure everybody understands what the goal is and why you’re doing what you’re trying to do.” – <b>Fire Chief in a low-performing county</b></p>	<p>“I think for our group, that data, that’s going to speak volumes. What was it before? What is it now? And what is the potential? And then make sure that we’re tracking that daily to be able to see that change.” – <b>911 Telecommunicator in a high-performing county</b></p>
Differences	<p>“I’m really having to work double time and hard to show what I’m suggesting . . . because in the outcome, it’s going to be better. It takes away liability, the patients do better, and it’s better for the employees.” – <b>911 Supervisor in a high-performing county</b></p> <p>“The biggest challenge was changing the mindset. . . It was very difficult to change their mindset to make them realize the importance of the program and the</p>	<p>“The trend of any leader of an organization is cutting edge. So, if it’s new, proven, and it’s going to be a good program for the community, you have to support it. We normally get support.” – <b>Fire Chief in a high-performing county</b></p> <p>“The county is going to have to see a need to invest money. If they don’t see a need, they are not willing to invest money. Their response is going to be ‘well who is going to pay for it? Go find a grant’. . . Every time</p>	<p>No notable quotations were identified.</p>	<p>“You have to be open to feedback. You have to establish a feedback mechanism. Because we got people that were like ‘Yeah, it makes sense where you want it to go, but that’s also where we put our drinks and our gloves.’ It’s like ‘Man, we made this change but it doesn’t seem like things are changing or we are getting poor compliance with people following the directive.’ There’s probably a reason.” – <b>Clinical Improvement Analyst (Emergency Medical Services / Medic)</b></p>

**Table 3 (continued)**

Initiating Support at Agencies	Obtaining Support from Senior Leadership	Obtaining Support from Emergency Response Teams	Initiating Support at Agencies
importance of what they could do. It took a little bit to get that buy-in from them, so they can be absolutely imperative [during cardiac arrest calls]. I think once they saw [the changes] a couple of times and they saw how it was going to not really affect their day-to-day operations, it doesn't affect their ability to perform their duties, it only enhances their ability to save somebody in the community. After they were able to absorb that message and see it, they completely bought into the idea." – <b>Director of Communications (911 telecommunicator) in a low-performing county</b>	you want to implement something new, their first response was 'figure out how to pay for it.' Well sometimes the counties, the cities, you need to pay for it out of pocket sometimes, because when it comes to grants, when it comes to asking other people for money for a project that you're not even willing to invest in, then how are you expecting somebody else to invest in?" – <b>Assistant Public Safety Director (Emergency Medical Services) in a low-performing county</b>		
	"We need to know that we all should be collaborative when doing these processes. We are just one body... What affects you, affects me. If you need help, then I'm there to help you and vice versa." – <b>Emergency Department Director in a low-performing county</b>		

in a high-performing county

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Furthermore, our results revealed a notable difference between high- and low-performing counties when acquiring support for a new initiative from senior-level personnel in emergency response agencies. For low-performing counties, it was critical to gain support from agency leaders to set an enthusiastic precedent to launch a new OHCA intervention successfully. This positive attitude from senior leadership could also help mitigate challenges related to emergency response staff bandwidth when trying to implement an intervention targeting bystander-initiated CPR rates.<sup>26,27</sup> Due to low-performing counties having a demonstrated need for more training and education, emergency responders must dedicate more time and effort to educating laypeople on the importance of CPR and AED use. To illustrate, responders may be required to employ multiple versions of life-saving training, such as an in-person 30-minute CPR and AED training session and a virtual CPR course to improve survival rates following an OHCA.<sup>26–28</sup>

Even though some of the general strategies mentioned in our study have been identified in prior literature, our work focused on emergency responders and OHCA interventions.<sup>11,15–18</sup> This information can be useful to streamline recruitment and implementation steps in future community-based OHCA interventions focused on improving 9-1-1 dispatch or CPR training for laypeople and emergency responders. Lastly, although our data was collected through the RACE-CARS Trial in North Carolina, the observed strategies for generating and maintaining support from key stakeholders in emergency response agencies may be applicable to other counties across the United States.

### Limitations

This study had 4 limitations that may have impacted the results. First, out of all 62 eligible counties in North Carolina, only 7 were studied in this investigation. While those 7 counties were randomly selected, it is possible that they had unique characteristics that may not be seen across all of North Carolina or other communities. Thus, the discussed techniques may not be generalized to all communities in NC. In addition, despite having a table on participant demographics (Table 1), we did not collect data on participants' age, sex, or years of experience. Lastly, the interviews took place remotely during the COVID-19 pandemic. As a result, responses provided by participants may have been influenced by new safety measures related to the pandemic.

### Conclusion

This study identified factors influencing support for the implementation of community-based OHCA interventions across high and low-performing counties. To summarize, effective implementation of community-based OHCA interventions may be facilitated by training, good communication, effective data-sharing, and regular meetings with teams and stakeholders. Our work may inform initiatives aimed at improving survival from OHCA in the future.

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## CRediT authorship contribution statement

**Natalie Ezem:** Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Allison A. Lewinski:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Julie Miller:** Writing – review & editing, Project administration, Investigation, Formal analysis, Data curation. **Heather A King:** Writing – review & editing. **Megan Oakes:** Writing – review & editing, Project administration. **Lisa Monk:** Writing – review & editing. **Monique A. Starks:** Writing – review & editing. **Christopher B. Granger:** Writing – review & editing. **Hayden B. Bosworth:** Writing – review & editing, Validation, Supervision, Funding acquisition, Conceptualization. **Audrey L. Blewer:** Writing – review & editing, Validation, Supervision, Methodology, Funding acquisition, Conceptualization.

## Declaration of competing interest

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