

Activating volunteer system increases bystander CPR and AED use, improves survival

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People suffering from sudden cardiac arrest are more likely to survive if cardiopulmonary resuscitation (CPR) and automated external

defibrillators (AED) are used as soon as possible. However, in an out-of-hospital setting survival rates are low, due to delays in care and low uptake of bystander CPR and AED use. Alerting nearby volunteers of the need for help when a person in the community goes into cardiac arrest increases rates of bystander CPR and defibrillation and improved survival rates, according to a study published today in the *Journal of the American College of Cardiology*.

"We know that for patients experiencing [sudden cardiac arrest](#) outside of a [hospital setting](#), their chances of receiving CPR or defibrillation from a bystander are low and this severely reduces their chances of surviving," said Martin Jonsson, Ph.D., MsC, a postdoctoral researcher at the Center for Resuscitation Science at the Karolinska Institutet in Stockholm and the study's lead author. "Our study demonstrates that we can increase bystander CPR and AED rates through these [volunteer](#) response systems, thus giving these victims a higher chance of receiving early CPR, defibrillation and increasing their 30-day survival."

The study pooled out-of-hospital cardiac arrests in five sites in four European countries with volunteer responder systems between 2015 to 2019 using available ESCAPE-NET registry data. Overall, more than 9,500 cases of out-of-hospital [cardiac arrest](#) were included in the study cohort after exclusion criteria. The volunteer responder systems were activated in 4,969 cases and in the other 4,857 cases they were not.

The rates were higher for all three outcomes in the alerted versus the non-alerted cases across all the included sites:

- Bystander CPR: 73.8% vs. 61.9%
- Bystander defibrillation: 7.9% vs. 4.6%
- 30-day survival: 12.4% vs. 10%

All volunteers registered online or via [smartphone application](#) to

participate in the response system, attested to previous CPR training and agreed to be located and dispatched as part of the system. All systems were activated by dispatchers at the sites' local/regional emergency medical communications centers in response to an emergency call regarding a suspected case of out-of-hospital cardiac arrest. Most of the sites utilized a smartphone application to locate and alert volunteer responders based on who was closest, while one site estimated location based on previously provided information regarding work and/or home address to alert volunteers via text message if an out-of-hospital cardiac arrest occurred near their home or office.

All systems were integrated with data on publicly available AEDs, including detailed information on their location and accessibility. The alert system would tell volunteer responders whether they were tasked with bringing a nearby AED to the site or going directly to the cardiac arrest to begin CPR. All volunteers were dispatched in conjunction with the emergency medical system, including ambulances with trained medical personnel, and in some sites, additional professional first responders such as firefighters or police vehicles equipped with AEDs.

"I believe, given the large sample size in our study and the strength of the sites included—all five had up-and-running volunteer systems as well as emergency response systems—our study findings support growing evidence for how new technology can recruit resources to sudden cardiac arrest sites within minutes and increase positive outcomes," Jonsson said. "For decades we have contended with low bystander CPR rates and underuse of AEDs by the public, leading to unnecessary deaths. We need large, randomized trials to show causal effects of volunteer response systems to determine if this is a replicable model that will help us save lives in communities around the world."

In an accompanying editorial, Janet E. Bray, RN, Ph.D., of the School of Public Health and Preventive Medicine at Monash University in

Melbourne, Australia, wrote, "Good volunteer first-responder programs are only one part of improving the community response to out-of-hospital cardiac arrest. Ultimately, increasing the rate of timely and equitable access to bystander CPR and defibrillation will have the largest effect on survival."

Study limitations include the observational nature of the study.

More information: Martin Jonsson et al, Dispatch of Volunteer Responders to Out-of-Hospital Cardiac Arrests, *Journal of the American College of Cardiology* (2023). [DOI: 10.1016/j.jacc.2023.05.017](https://doi.org/10.1016/j.jacc.2023.05.017)

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