

Optimising the impact of smartphone-activated volunteer responder programs on out-of-hospital cardiac arrest outcomes by increasing responder density

Alan Morrison, Paul Simpson 

The chain of survival outlines the critical steps in resuscitation that increase the likelihood of survival for people who experience out-of-hospital sudden cardiac arrest, including bystander cardiopulmonary resuscitation (CPR) and early defibrillation as important components.¹ Some authors suggest that focusing on the links at which most patients enter the chain would achieve the greatest improvements in outcomes.²

Survivors of out-of-hospital cardiac arrest often remark, “I was lucky,” especially when someone nearby noticed their collapse and performed CPR or defibrillation before emergency medical services personnel had arrived. In Australia, where most out-of-hospital cardiac arrests happen in private residences, this “luck” may simply be that the event was in a public location. But what if we could reduce the role of luck in survival? What if receiving bystander CPR was highly probable, regardless of where the out-of-hospital cardiac arrest occurs?

Smartphone-activated volunteer responder (SAVR) programs may reduce the element of luck in surviving cardiac arrest. While the technology often garners attention in these initiatives, it is the responders themselves who are its foundation and ultimately determine the impact of the program.

In this issue of the *MJA*, Delardes and colleagues report a population-based observational cohort study of the impact of an SAVR program on survival to hospital discharge after sudden cardiac arrest in the community.³ The authors analysed data, extracted from the Victorian Ambulance Cardiac Arrest Registry (VACAR), for 9196 out-of-hospital cardiac arrests not witnessed by emergency medical services personnel during 12 February 2018 – 31 August 2023. In 1158 incidents (12.6%), an SAVR arrived on the scene; 897 of these events (77%) were in private residences, and the SAVR arrived before emergency medical services in 564 cases (48.7%). The arrival of SAVRs before emergency medical services was associated with greater likelihood of bystander CPR (adjusted odds ratio [aOR], 7.59; 95% confidence interval [CI], 4.97–11.6), bystander defibrillation (aOR, 16.0; 95% CI, 9.23–27.7), and survival to hospital discharge (aOR, 1.37; 95% CI, 1.02–1.85) than for cases not attended by SAVRs.³ The observational nature of the study precludes claims of causality, but the findings are nevertheless significant and contribute to growing international evidence for the positive community impact of SAVR programs.

A key factor in the success of SAVR programs is responder density, per 100 000 population or square kilometre.⁴ Higher density implies closer proximity of responders to out-of-hospital cardiac arrests, facilitating their more rapid arrival, sometimes before emergency medical services. Delardes and colleagues did

not report the number of SAVRs in Victoria or by remoteness, but SAVRs arrived before paramedics in only 6.1% of cardiac arrests included in their analysis.³ SAVR programs often initially involve significant investment in promotion and awareness to recruit responders, to create an initial hype. Engaging people in health services and the community, identifying “recruitment champions”, and coordinating media coverage help attract enthusiastic SAVRs early, but such intense recruitment efforts are rarely sustainable. As programs move beyond the initial phase there is a risk of a “set and forget” mindset, leading to a plateau in new SAVR recruitment and gradual attrition of current participants. The Gartner hype cycle of new technologies or innovations is a useful model for SAVR implementation:⁵ an initial surge of enthusiasm may be followed by a “trough of disillusionment”, then a “plateau of productivity” if the program becomes sustainable.

Maintaining and expanding a committed responder community requires focused effort and investment to ensure responder density promotes optimal outcomes after out-of-hospital cardiac arrest. Progression to the plateau of productivity should not be assumed. Health services implementing SAVR programs must recognise that they are entering into a social and psychological contract with volunteers: as responders commit to improving survival after out-of-hospital cardiac arrest, health services must commit to optimising responder wellbeing and experience.⁶

Enhancing the responder experience could involve several actions. First, ensuring their psychological safety increases the likelihood of sustained participation. As noted by Delardes and colleagues, responders should have access to timely and barrier-free debriefing and wellness support.³ Second, the physical safety of responders should be secured with highly sensitive dispatch processes that identify incidents in which violence or assault are likely, and cancel responder activation as early as possible. Third, embedding routine and recurring contact, even in the absence of live activations, could sustain responder commitment, especially given the infrequency of individual responses. A limitation of these programs is that these initiatives are community-oriented but the volunteer experience is individualised and potentially isolated, limiting opportunities for social connection, shared learning, and collective identity among responders. Establishing a community of smartphone responders could build a sense of belonging, leading to sustained engagement and enthusiasm. Such communities could be facilitated by the health system managing the initiative or organised by the responders themselves. Similar initiatives in more traditional first responder programs overseas (not SAVR programs) have successfully sustained engagement

and improved retention.⁷⁻⁹ Despite differences between such systems and the less centralised smartphone responder model, these strategies are worth exploring.

Optimising the responder experience and fulfilling the social contract can yield benefits in two ways. First, it may sustain engagement beyond the initial hype, reducing attrition and consolidating the responder base. Second, satisfied early adopters can become powerful word-of-mouth marketers, attracting a second wave of new responders. These satisfied responders provide social proof, promoting a bandwagon effect in their communities.¹⁰

In summary, SAVR programs are promising public health initiatives for improving survival after out-of-hospital cardiac arrest, effectively reducing the role of luck, especially when people have arrests in private residences. Responder density is crucial to program success. Acknowledging the social and psychological contract between health services and responders, and proactively fulfilling associated obligations, may reduce attrition and, through social proof, build a sustainable responder community beyond the initial program hype.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

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