

# Wisdom of the Crowd in Saving Lives: The Life Guardians App

Eli Jaffe, EMT-P, PhD;<sup>1</sup> Ziv Dadon, MD;<sup>2</sup> Evan Avraham Alpert, MD<sup>3</sup>

1. Director of Training, PR, Volunteer Activities, Marketing and International Relations, Magen David Adom, Tel Aviv, Israel
2. Department of Internal Medicine, Shaare Zedek Medical Center, Jerusalem
3. Department of Emergency Medicine, Shaare Zedek Medical Center, Jerusalem

## Correspondence:

Evan Avraham Alpert, MD  
 Department of Emergency Medicine  
 Shaare Zedek Medical Center  
 Shmu'el Bait St 12, Jerusalem, 9103102  
 E-mail: evanavrahamalpert@gmail.com

**Conflicts of interest:** none

**Keywords:** cardiopulmonary resuscitation; crowdsourcing; mass-casualty incidents; tourniquets

## Abbreviations:

EMS: Emergency Medical Services  
 EMT: emergency medical technician  
 MCI: multi-casualty incident  
 MDA: Magen David Adom

**Received:** January 23, 2018

**Revised:** April 23, 2018

**Accepted:** May 6, 2018

**Online publication:** September 17, 2018

doi:10.1017/S1049023X18000754

## Abstract

Multi-casualty incidents (MCIs) continue to occur throughout the world, whether they be mass shootings or natural disasters. Prehospital emergency services have done a professional job at stabilizing and transporting the victims to local hospitals. When there are multiple casualties, there may not be enough professional responders to care for the injured. Bystanders and organized volunteer first responders have often helped in extricating the victims, stopping the bleeding, and aiding in the evacuation of the victims. Magen David Adom (MDA translated as “Red Shield of David”), the national Emergency Medical Services (EMS) provider for Israel, has successfully introduced a program for volunteer first responders that includes both a mobile-phone-based application and appropriate life-saving equipment. Most of the responders, known as Life Guardians, are already medical professionals such as physicians, nurses, or off-duty medics. They are notified by a global positioning system application if there is a nearby life-threatening incident such as respiratory or cardiac arrest, major trauma, or an MCI. They are given a kit that includes a bag-valve mask device, oropharyngeal airways, tourniquets, and bandages. There are currently 17,000 Life Guardians, and in the first-half of 2017, they responded to 253 events.

The Life Guardians are essentially an out-of-hospital manpower multiplier using a simple crowdsourcing application who have the necessary skills and equipment to treat those in cardiopulmonary arrest, or victims of trauma, including MCIs. Such a model can be integrated into other systems throughout the world to save lives.

Jaffe E, Dadon Z, Alpert EA. Wisdom of the crowd in saving lives: the Life Guardians app. *Prehosp Disaster Med.* 2018;33(5):550–552.

## Introduction

Multi-casualty incidents (MCIs) continue to occur throughout the world, whether by shootings such as in Las Vegas (Nevada USA) on October 1, 2017; truck ramming in Nice on July 14, 2016; or natural disaster such as the earthquake in Mexico on September 19, 2017. In each instance, the local Emergency Medical Services (EMS) have done a professional job at stabilizing and transporting the victims to local hospitals, often at risk to themselves. When there are multiple casualties, there may not be enough professional prehospital providers to care for the injured. Bystanders and organized volunteer first responders have often helped in extricating those who are trapped, stopping the bleeding, and aiding in the evacuation of the victims.

The Boston Marathon bombing (Massachusetts USA; 2013) demonstrated the importance of bystander application of tourniquets in the field. However, not all victims with extremity bleeding had tourniquets applied to them; some were venous tourniquets, which may lead to paradoxical bleeding, and the described use of improvised tourniquets may not be as effective as commercially available, purpose-designed devices.<sup>1</sup> On an individual level, bystanders have proven to save lives amongst those who suffered from cardiac arrest. Timely bystander cardiopulmonary resuscitation has proven effective in terms of survival to hospital discharge.<sup>2,3</sup>

Often, the bystander is a medical professional such as a physician, nurse, paramedic, or emergency medical technician (EMT). Many off-duty professionals do help in life-saving events as good Samaritans; however, in other instances, they are located close to the incident but have no knowledge of it.

## Report

Magen David Adom (MDA; translated as “Red Shield of David”), the national EMS provider for Israel,<sup>4</sup> utilizing the concept of crowdsourcing off-duty medical professionals,

Date	Cardiac or Respiratory Arrest	Major Trauma	Head Trauma	Minor Trauma	Loss of Consciousness	Seizures	Other	Total
January	18	0	0	1	28	0	3	50
February	19	1	0	0	28	0	1	49
March	13	0	0	1	22	1	1	38
April	11	0	0	3	27	0	2	43
May	6	1	0	5	23	1	8	44
June	8	0	1	3	12	1	4	29
<b>Events Sum</b>	75 (29.6%)	2 (0.8%)	1 (0.4%)	13 (5.1%)	140 (55.3%)	3 (1.2%)	19 (7.5%)	253

Jaffe © 2018 Prehospital and Disaster Medicine

**Table 1.** Life Guardians' Event Responses within the First Six Months of 2017

has successfully introduced a bundled program that includes both a first responder phone-based application and appropriate life-saving equipment. These first responders, known as Life Guardians, are all either health professionals such as physicians, nurses, prehospital care providers, or those who have completed a comprehensive first aid course. They are all officially registered and undergo a background check verifying their professional status. The global positioning system guided application can easily be downloaded from either the Google Play (Google; Mountain View, California USA) or the Apple App store (Apple; Cupertino, California USA). The application is able to identify all Life Guardians who are able to arrive at the scene within five minutes, as well as before the arrival of the ambulance. They are notified if there is an immediate life-threatening incident such as respiratory or cardiac arrest, or major trauma. The application allows for direct conversation with the MDA call center as well as the ability to aid in navigating to the incident site. If there is an MCI, then the radius of responders can be increased. They are given a kit that is 32x32x12 cm in size. For physicians, nurses, and paramedics, the kit includes a bag-valve mask device, oropharyngeal airways, tourniquets, and bandages. For EMTs, the kit contains the same equipment minus the airway devices. Each kit costs approximately 50 US dollars and MDA invested approximately 800,000 US dollars in the program. This includes payment for equipment as well as recruitment advertisements.

All Life Guardians are insured by MDA against malpractice. There is regular auditing of the program on an organizational level, and if there would be any reported substandard medical activity, a procedure is in place so that this is investigated by the regional paramedic supervisor. Similar to the Good Samaritan legislation that exists in the United States and parts of Europe, Israel, in 1998, enacted the law known as "Do not stand idly by your neighbor" (based on Leviticus 19:16).<sup>5</sup> This obligates bystanders to assist a person in danger, or at the very least, call for help.

A recent analysis of the Life Guardian project reveals 17,000 Life Guardians with 12.0% physicians, 13.0% nurses, 16.0% civilian EMTs, 16.0% former army EMTs, 4.0% paramedics, 35.0% graduates of first aid courses, and 4.0% other or unknown. Table 1 describes the first six months of 2017 whereby the Life Guardians responded to 253 events including (according to the

prehospital call designation) 140 victims suffering from loss of consciousness (55.3%), 75 from cardiac or respiratory arrest (29.6%), and 16 from trauma (6.3%). There were no actual MCIs during this time.

#### Discussion

The use of crowdsourcing using a simple phone application has been implemented in more than 600 communities in the United States. The PulsePoint Respond mobile device (PulsePoint Foundation; Pleasanton, California USA) is able to locate registered personnel who are within 400 meters of a suspected cardiac arrest.<sup>6,7</sup> It is also able to locate nearby automatic external defibrillators. It should be noted that this is limited both in terms of the radius of response, includes a large number of non-medical professionals, and is activated only for cardiac arrest. One of the unique aspects of the Life Guardians program is that they can also be activated for life-threatening traumatic events as well as MCIs.

Initially, the MDA volunteer program emphasized those who work out of the ambulance station, including a special program for youth volunteers. In addition, MDA has a cadre of 4,800 on-call volunteer first responders who first became active during a series of terrorist attacks that affected Israel during the second intifada between 2001-2004. These were all part of the organized prehospital system. They all underwent training through MDA, refresher courses, and fulfilled a periodic ambulance requirement. Procedures that they performed included bag-valve mask ventilation, application of bandages and tourniquets, as well as extrication and transport of victims.<sup>8,9</sup>

However, for the Life Guardians, the professional background of the physicians, nurses, and paramedics is considered sufficient to enable them to perform at least critical Basic Life Support skills in either a trauma or cardiac arrest situation. Physicians and nurses must have taken Advanced Cardiac Life Support. In addition, they are given a brief introduction to the equipment and operations of MDA. The EMTs take a 20-hour course concentrating on resuscitation skills, trauma management, and bleeding control. Those taking the first aid course undergo a 20-hour program which focuses on similar concepts but in less depth. The Ontario (Canada) Prehospital Advanced Life Support Major Trauma Study,<sup>10</sup> and a similar study in out-of-hospital cardiac arrest,<sup>11</sup> (although using professional prehospital care providers) emphasize

the importance of Basic Life Support skills in the out-of-hospital setting. After the World Trade Center (New York, USA) attack on September 11, 2001, there was much criticism about masses of volunteers who converge on the scene of a disaster but are unable to help as they don't have any equipment or method of communicating with EMS.<sup>12,13</sup> The Life Guardians bundled program is specifically designed to address this issue and enable real and meaningful volunteer contributions to an MCI.

### Limitations

There are several limitations to this program. There are currently no outcome data. It is known that the Life Guardian responded to the event, however, the impact of their care is unknown. In addition, there is no control group of patients who were not treated by the Life Guardian volunteers. During this time period,

there were no MCIs, so response and performance of the Life Guardians can only be extrapolated by the prior contributions of MDA volunteers to MCIs.<sup>8,9</sup> Clear anecdotal experience in Israel is that the majority of volunteers who are notified to an MCI will respond, especially those with a medical background.

### Conclusion

The Life Guardians are essentially an out-of-hospital manpower multiplier using a simple crowdsourcing application who possess the necessary life-saving skills and equipment. While Israel is a small country that is able to support such a project on a national level, metropolitan areas, individual states, or other countries similar in size can also implement a comparable system in order to save lives in the cardiorespiratory, trauma, and multi-casualty settings.

### References

1. King DR, Larentzakis A, Ramly EP; Boston Trauma Collaborative. Tourniquet use at the Boston Marathon bombing: lost in translation. *J Trauma Acute Care Surg.* 2015;78(3):594–599.
2. Hollenberg J, Herlitz J, Lindqvist J, et al. Improved survival after out-of-hospital cardiac arrest is associated with an increase in proportion of emergency crew witnessed cases and bystander cardiopulmonary resuscitation. *Circulation.* 2008;118(4):389–396.
3. Kitamura T, Iwami T, Kawamura T, et al; Japanese Circulation Society Resuscitation Science Study Group. Nationwide improvements in survival from out-of-hospital cardiac arrest in Japan. *Circulation.* 2012;126(24):2834–2843.
4. Ellis DY, Sorene E. Magen David Adom—the EMS in Israel. *Resuscitation.* 2008;76(1):5–10.
5. [http://fs.knesset.gov.il/14/law/14\\_lsr\\_211515.PDF](http://fs.knesset.gov.il/14/law/14_lsr_211515.PDF) (Hebrew). Accessed December 3, 2017.
6. Brooks SC, Simmons G, Worthington H, Bobrow BJ, Morrison LJ. The PulsePoint Respond mobile device application to crowdsource Basic Life Support for patients with out-of-hospital cardiac arrest: challenges for optimal implementation. *Resuscitation.* 2016;98:20–26.
7. Dainty Katie N, Vaid Haris, Brooks Steven C. North American public opinion survey on the acceptability of crowdsourcing Basic Life Support for out-of-hospital cardiac arrest with the PulsePoint mobile phone app. *JMIR Mhealth Uhealth.* 2017;5(5):e63.
8. Alpert EA, Lipsky AM, Elie ND, Jaffe E. The contribution of on-call, volunteer first responders to mass-casualty terrorist attacks in Israel. *Am J Disaster Med.* 2015;10(1):35–39.
9. Jaffe E, Alpert EA, Lipsky AM. A Unique program to incorporate volunteers into a nationwide Emergency Medical System: maximizing preparedness for a mass incident. *JAMA Surg.* 2017;Jul 12.
10. Stiell IG, Nesbitt LP, Pickett W, et al; OPALS Study Group. The OPALS Major Trauma Study: impact of Advanced Life Support on survival and morbidity. *CMAJ.* 2008;178(9):1141–1152.
11. Stiell IG, Wells GA, Field B, et al; Ontario Prehospital Advanced Life Support Study Group. Advanced Cardiac Life Support in out-of-hospital cardiac arrest. *N Engl J Med.* 2004;351(7):647–656.
12. Cone DC, Weir SD, Bogucki S. Convergent volunteerism. *Ann Emerg Med.* 2003;41(4):457–462.
13. Auf der Heide E. Convergence behavior in disasters. *Ann Emerg Med.* 2003;41(4):463–466.