

**Methods:** Data were collected from several sources, including reports from medical caregivers on the ground and from the airborne medical crews, logs of the Israeli combat rescue airmedical unit, logs of the Israeli Air Force and a computerized database for debriefing airmedical evacuations.

**Results:** There were 53 casualties, of which, 25 were pronounced dead and 28 required airmedical evacuation to Level-1 Trauma Centers. Seven airmedical evacuations were performed, four of which to Soroka Medical Center (mean flight time = 45 minutes, range 40–50 minutes, median 45 minutes). One went to Hadasa Ein Carem Medical Center (flight = 50 minutes), one to Shiba Medical Center (flight time = 80 minutes) and one to Ben Gurion Airport (flight time = 40 minutes), from there, by ground to different nearby hospitals.

Four evacuations were performed with a UH-60 Blackhawk helicopter (two patients per evacuation). Two evacuations were performed with the CH-53 sea stallion helicopter (mean = 1.5 patients per evacuation). One evacuation was performed with the C-130 Hercules airplane (16 patients). Two evacuations were redirected to a closer destination due to deterioration of the patient's condition. During these evacuations, one unit of blood was administered, and a needle application using a vignon needle was performed to two patients. no patients died during transport.

**Conclusions:** Airmedical evacuation was a pillar in medical evacuation of wounded patients in this scenario. Actions and judgment of the airborne medical crews allowed for the safe transport of all patients.

**Keywords:** airmedical evacuation; Israel; mass-casualty incident; motor vehicle crash; remote location

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### Model for Preventing Post-Traumatic Stress Disorder Symptoms among Adolescent Volunteers on Ambulance Teams Exposed to Terrorism

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**Introduction:** In the ambulance service of Magen David Adom (MDA), the national first aid organization in Israel, volunteers 16–18 years who work as assistant paramedics. Between the years 2000–2002, the ambulance teams of MDA treated thousands of victims of terrorist attacks. This study examined the factors affecting the number of post-traumatic symptoms among these ambulance teams, in order to develop a model for prevention of post-traumatic stress disorder (PTSD).

**Methods:** The study included 620 young volunteers (mean age: 17 years) from around the country who had been volunteering for about one year. They responded anonymously to the questionnaire, which included demographic information, motivation to volunteer, exposure variables (including terrorist attacks and other traumatic events), and post-traumatic and other psychiatric symptoms.

**Results:** None of the volunteers had a clinically significant psychiatric disorder, including PTSD. Vulnerability to post-traumatic symptoms was found among non-religious

female volunteers, volunteers whose motivation was defensive (self-centered), those from regions with low levels of terrorist attacks, and those who witnessed dead bodies during such attacks.

**Discussion:** This study points to a prevention model that identifies sub-populations of volunteers who are at a greater risk to develop post-traumatic symptoms. Primary prevention among such sub-groups will include an emphasis on their preparedness. Secondary prevention will include ensuring their participation in post-action debriefing, and further monitoring to identify post traumatic reactions—if they occur.

**Keywords:** adolescent; Magen David Adom; post-traumatic stress disorder; terrorism; volunteers

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### Magen David Adom—C4I: Meeting the Needs in the Field

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**Introduction:** Magen David Adom (MDA), Israel's National emergency medical services (EMS) with an advanced life support (ALS) and basic life support (BLS) system, runs approximately 1,250 emergency calls per day. Magen David Adom uses a Computer-Aided Dispatch System (CADS) since the early 1990s. In recent years, major advances were made by MDA personnel. Magen David Adom has a fleet of approximately 900 emergency response vehicles, with 3,000 volunteers active as first responders in their communities.

**Methods:** The purpose of this study was to describe major achievements in the upgraded C4I system of MDA, compared to the first version of the system.

The major new features in the new system included: (1) online alerts of irregularities; (2) personalized, automatic activation of first responders; (3) computerized systems for multi-casualty incident management; (4) medical control of patient records; and (5) automatic alerts to the operations center officer and management.

**Results:** The objectives of the upgraded system were to: (1) reduce the response times to patients; (2) more efficiently use all of the available resources (ambulances, first responders); (3) enable quality assurance; and (4) enable the management of multi-casualty situations through a computerized system.

**Conclusions:** The involvement of field personnel is essential. The new system enables more effective use of volunteers. The online involvement of senior managers monitoring the activities is critical. Online quality assurance cannot be replaced by *post facto* procedures. Quality assurance should be a teaching system, not a disciplinary one. Criteria must be established, and the flow and amount of information must be accounted for.

**Keywords:** C4I; communications; emergency medical services; Israel; Magen David Adom

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