

Trauma System Configurations in Other Countries: The Israeli Model

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KEYWORDS

• Mass casualty • Trauma • Israel • System • Emergency medical services • Terror

KEY POINTS

- Israel is a small country with a unique trauma system that was developed from the experience gained in peace and in war.
- The state is a full democracy and health care is mandated to all Israeli citizens, without exception.
- The prehospital level is maintained mainly by the emergency medical services, Magen David Adom (MDA, meaning Red Shield of David).
- There are 6 level I trauma centers and 14 level II trauma units in Israel.
- Facing multiple mass casualty incidences, a unique protocol was developed that ensures a fast and effective response to such devastating events.

THE ISRAELI TRAUMA SYSTEM

Israel has a population of around 7 million people. It consists of 20,720 km², 423 km from north to south, and between 14.5 and 114 km from east to west. Compared with the United States, with a population of circa 310,000,000, and with an area of some 9,631,365 km², Israel is a small country. Only 15.45% of the land is arable, and the rest is made up of urban areas, mountains, and desert. Israel is a full democracy and health care is mandated to all Israeli citizens, without exception. Israel has a Mediterranean climate with long, hot, rainless summers and short, cool winters with some rainfall. The geography is varied, with desert in the southern part and fertile valleys in the north. The coastal plain is flat, and the central part of the country is hilly and crossed by several valleys. The northern part of the central highlands has some mountainous

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terrain (1219 m). The size of the country means that most areas are not remote from one another, although mountainous areas in the north and several gorges are inaccessible to regular vehicles. Most of the population lives in and around the large cities of the nation's capital, Jerusalem, Tel Aviv, Haifa, and Beersheba. There are many other diverse habitats, ranging from the kibbutz to nomadic Bedouin communities.

The development of trauma systems in Israel was initiated by the Ministry of Health in the mid-1990s, according to the recommendations of a designated national committee formed in the early 1990s to improve trauma care.¹ The prehospital level is maintained by 2 organizations: one is the emergency medical services (EMS), Magen David Adom (MDA, Red Shield of David), and the other is the military medical evacuation units. Military evacuation units are used mainly for military operations and are not related to civilian units. Six medical centers are designated as level I trauma centers, and 14 other hospitals are level II trauma centers. A trauma center's level is accredited by a governmental committee assigned by the Ministry of Health, according to designated protocols. Prehospital Trauma Life Support (PHTLS) and the American College of Surgeons Advance Trauma Life Support (ATLS) courses are provided to all paramedics and surgery residents nationwide. The Israeli trauma system is further supported by The Israel National Registry, established in 1995. The trauma registry provides the tools for monitoring and quality assurance, at both the hospital and national levels.^{2,3} A national trauma council advises the Ministry of Health on issues related to trauma, such as advances, new technologies, and experience gained by other trauma centers.

According to the National Registry, there are around 36,500 trauma hospitalizations per year nationwide. The trauma rate is 4.7 per 1000 population, and the lifetime risk of injury hospitalization is 1:3. Data collected from the year 2009 showed that 65% of all trauma victims are male. Children in the age range of 0 to 14 years make up the largest group of injured patients (27%), and injuries sustained by motor vehicle accidents (MVAs) comprise 40% of the severe injuries (Injury Severity Score [ISS] ≥ 15). The main mechanisms of trauma for the year 2009 are detailed in **Fig. 1**. A total of 9.3% of injuries had an ISS greater than 16. The yearly intensive care unit (ICU) trauma-related admission rate for that year was 6.3%, the average ICU stay was 6.7 days, and the average hospital stay was 6.4 days. The mortality among all hospitalized patients with trauma is 1.2% to 2%.⁴

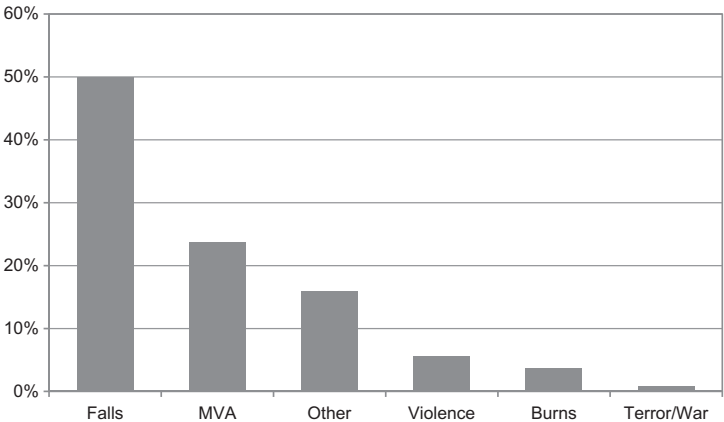


Fig. 1. Mechanisms of injury recorded in the Israeli National Registry trauma database for 2009.

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