

## Session 7: Planning 2

Chairs: TBA

### Emergency Health System Evaluation Using Combined Simulation and Global Information System

#### Methodology

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When a major incident occurs, transportation and hospital capacities become critical resources. Their availability has a crucial impact on the number of casualties and the severity of injuries. It is necessary to test the response tactics and assess the efficiency of the rescue efforts using the resources available and number of victims. Due to the high cost of real-life exercises, the use of a computer simulation seems appropriate. A methodology combining simulation approaches and the visualization capabilities of geographical information systems is suggested.

The primary input parameter of a running simulation is the number of casualties that can be separated into individual priority classes. Estimated times are assigned to all of the activities within the chain of care. Based on the input parameters, defined circumstances, and tested procedures, the simulation deterministically computes the total time required for the complete response to the situation. The simulation is rerun for all the  $n$  km map squares of the area of interest—this way, a map with the estimated response times for the defined territory is obtained. The map is colored-coded according to chosen criteria, (e.g., time scale or number of casualties). High risk areas, such as highways, railways, and industrial zones are projected onto the map. Areas chosen can be evaluated in more detail.

The suggested simulation methodology is flexible and allows the users to efficiently test standard operational procedures and assess the preparedness of emergency services.

**Keywords:** computer simulation; global information systems; healthcare; preparedness; simulation

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### Mass-Casualty Incident Contingency Plan: Hospital Preparedness and Medical Protocols

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Between September 2000 and September 2006, 8,000 casualties resulting from terrorist attacks were treated in Israel. Of these casualties, there were around 650 severe injured civilians, around 950 moderately injured civilians, and >5,100 minimally injured civilians, including those with Acute Stress Reactions (ASR). There were 1,115 deaths recorded. Most of these casualties were treated in the Israeli hospitals that were operating in a Mass-Casualty Incident (MCI) Mode.

By definition, a MCI involves at least a temporary imbalance of resources. Staff involved in patient care may have little experience. The most experienced caregivers may be absent or devoting their attention to the logistics of the event, making them unable to devote their time to casual-

ties. In order to save many lives as possible during a MCI, medical personnel should follow clear and predetermined orders, with the ability to be flexible as needed ad-hoc. The national doctrine related to management was developed by national committees including key personnel from hospitals, prehospital, and the Medical Corps of the Home Front Command (HFC) of the Israeli Defense Forces (IDF). The doctrine included topics related to: (1) the training of personnel for immediate response; (2) medical equipment maintenance; (3) manpower control; and (4) a nationwide information system.

This paper will present the national contingency plan and hospital preparedness for a MCI, including medical protocols developed in order to provide the best care during a MCI.

**Keywords:** contingency plan; injured civilians; Israel; mass-casualty incidents; terrorist attacks

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### Disaster Response Plan of Iranian Blood Transfusion

#### Organization

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Blood transfusion can be a major health need in the aftermath of disasters. The availability of units of blood in the disaster zone could affect the outcome of the emergency care of victims. The potential destruction of the health infrastructures along with the large number of victims as a result of a disaster necessitate preparedness of the national transfusion system. Important considerations of blood transfusion in disasters include the availability of blood units, the need for emergent donation, a large number of first-time donors and over collection, the safety of blood, and finding new, regular donors.

Iran is one of the most disaster-prone countries in the world. Learning from the previous experiences, particularly the Bam earthquake, the Iranian Blood Transfusion Organization has prepared a disaster response plan. This presentation provides the experience of the Iranian Blood Transfusion Organization in the Bam earthquake, lessons learned from the experience, and blood transfusion data during the event including the number of blood units used, the number of blood units donated, the Provinces that provided blood units, etc. The current disaster response plan of the Iranian Blood Transfusion Organization, based on previous experiences, is explained.

**Keywords:** earthquakes; disasters; Iran; transfusions; response plan

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### Tangible User Interfaces in Order to Improve Collaborative Interactions and Decision-Making during Disaster Management

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Often times, people must cooperate and interact in teams or discussion groups to achieve a common purpose, such as decision-making, analyzing a problem, or developing an

idea. Providing and sharing geo-information for a group of participants can be achieved with different traditional methods. This can include a map laid on the table, data projected on a wall, or computer monitors. A new approach to improve collaborative interactions focuses on two main aspects: (1) an advanced visualization of the information; and (2) a new approach in the human-computer interaction.

The traditional way of displaying geographical datasets is replaced by tangible interfaces in which data are displayed on a table and used as central point for the discussion. The data presented on the table also can be accompanied by other devices, such as liquid crystal display (LCD) or plasma screens, where it can be displayed in different environments, such as two-dimensional, augmented reality, or three-dimensional virtual environments, providing a different visual approach to the same dataset.

Users interact with the system directly on the surface with their hands, drawing pens, or special colored patterns. The system reacts to the movements on the table and displays the requested information on the table. The new interaction is intuitive, attracts people to the table, and invites them to interact with the table itself. It will be tested during disaster exercises.

**Keywords:** collaborative interactions; decision-making; disaster management; human-computer interaction; user interfaces  
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## Poster Presentations—Theme 12: Preparedness

### (170) Factors Affecting Disaster Volunteer Retention

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Recruitment of new disaster volunteers is an ongoing and expensive process, with frequent turnover in the volunteer pool. The purpose of this project is to identify what factors contribute to this turnover, and to make recommendations for improving retention. A review of the literature regarding successful volunteer retention will be presented.

In this research project, volunteers in the disaster services of the American Red Cross were surveyed as to their reasons for volunteering, the areas in which their expectations were satisfied or not, and why they have stayed involved, or why they have become inactive.

Subjects will be four groups: (1) active national disaster response team members; (2) inactive national disaster response team members; (3) active disaster mental health team members (local or national); and (4) inactive disaster mental health team members (local or national). All subjects were active since 11 September 2001 and for a minimum of six months prior to data collection.

For this presentation, surveys will be conducted over the telephone by volunteers. Names will be chosen randomly from lists of active and inactive Disaster Services Human Resources and Disaster Mental Health Teams in the

Greater Rochester Chapter of the Red Cross in Rochester, New York.

**Keywords:** American Red Cross; disaster volunteers; mental health teams; response teams; volunteer retention  
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### (171) Role of National Poisons Information Centre in the Response to Nuclear Accidents in the Netherlands

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The Dutch National Poisons Information Centre (NPIC) of the National Institute for Public Health and the Environment (RIVM) is officially involved in the response network for radiological incidents, called the Unit Planning and Advice nuclear (EPAN). The EPAN consists of a front office and two back offices, one for radiological measurement and one for medical assessment (Ministry of Health) of radiological incidents. The back offices present their information to the front office, which integrates the information in order to advise the policy team and ministers concerned. Each back office receives specific information from several support centers. The network shares information and knowledge via a secure website. In case of emergencies, the NPIC advises the Ministry of Health on the measures “Iodine prophylaxis”, “Evacuation” and “Sheltering in Place”, and “Patient Management” based on available radiological information of the incident. The NPIC provides protocols on decontamination and radionuclide-specific treatments. In May 2005, the EPAN was tested in a national nuclear accident exercise. More than 1,100 administrators, officials, and relief workers from municipalities, provinces, ministries, and emergency services were involved in managing a simulated accident at the Dutch nuclear power plant. The exercise provided an estimate of the feasibility of the various measures and time needed for implementation. Alertness training continues through smaller exercises. In 2007, the NPIC will start an educational program for healthcare personnel with the goal of increasing radiological incident preparedness in triage, decontamination, and management of patients.

**Keywords:** decontamination; network; radiological incident; radionuclide-specific treatments; simulated accident  
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### (172) The “Hospital Preparedness for Contaminated Patients” Score (HPCPS) as a Proposed Tool for a More Objective Assessment of Hospital NBC Readiness

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A survey of all 118 acute-care hospitals in Austria was conducted in order to determine the ability of the hospitals to admit and treat contaminated patients safely. No such