

presentation will provide a description and evaluation of 19 two-day meetings attended by approximately 2,800 professionals from both hospitals and the community medical system providing: (a) essential knowledge and skills required to deal clinically with a non-conventional warfare attack; and (b) ability to organize an educational intervention in their respective settings to prepare relevant staff to manage Mass Casualty Events stemming from either a chemical or biological attack. The time frame for developing and implementing the education was approximately five months. Evaluation data from an analysis of pre and post-session questionnaires that participants were required to complete, are presented. The pre-session questionnaire was a self-assessment of the participants' level of knowledge required to clinically diagnose and treat victims, and their perceived ability / readiness to organize an educational intervention for healthcare workers in their respective work settings. The post-session questionnaire gathered data relative to the contribution of the two-day meeting to their ability to effectively manage a chemical/biological attack, diagnose and treat the victims, and to implement the educational intervention.

**Keywords:** attack, biological or chemical; diagnosis; education; evaluation; multi-casualty events; organization; preparedness; training; terrorism; treatment  
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## Free Papers: Global Sharing: Disaster Public Health

### Status of Rural Injured Two Years after 2001 Gujarat Earthquake

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**Introduction:** It is acknowledged that the effects of disasters in developing countries have been poorly documented. The surgical outcome of hospital care and physical/psychosocial rehabilitation in rural victims were determined two years after the massive 2001 Gujarat earthquake (India).

**Methods:** The current locations of the displaced victims who were operated on for earthquake-related injuries were determined. A community-health worker interviewed these patients in the local language using an oral questionnaire. They were queried about orthopaedic implants, disability, deformity, residual pain, occupational and economic rehabilitation, shelter, post-traumatic stress disorder (PTSD), and perceptions of the health care rendered.

**Results:** 133 of the 179 surgically treated, non-urban victims were located in 11 villages. There were 10% missed injuries, 19% infection rate, restricted range of motion in 12%, non-union rate in 23%, and re-operations in 30.5% of

the patients. 51% had resumed their previous occupation, but only 30% had recovered economically. Of the 98% who had their homes destroyed, 89% had their homes rebuilt. Residual sadness was the only significant PTSD symptom.  
**Conclusions:** Following this earthquake (PICE scoring: Stage III, Dynamic, Paralytic, national disaster), the shortcomings of the orthopaedic medical care provided included missed injuries, inappropriately timed and aggressive implant surgeries, short time commitments, lack of follow-up, and a high rate of re-surgeries calling for a need for the training of regular surgeons and physicians in Disaster Medicine. The low infection rate was attributable to the use of potent antibiotics in an unexposed rural population. The occurrence of PTSD was marked three to six months after the event, but was minimal two years post-quake. This study indicates some similarities and some notable differences compared to disaster studies from the developed world.

**Keywords:** antibiotics; displaced persons; earthquake, Gujarat; follow-up; infection; injuries; orthopedics; outcome; perceptions; post-traumatic stress disorder (PTSD); rural; surgery; training  
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### Earthquake Relief Activity in Two Islamic Countries: Afghanistan and Iran—What Was the Difference and Which Was Better?

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**Introduction:** The Japanese Red Cross Society (JRCS) operated earthquake relief activity in Afghanistan and Iran in 2002. Though both earthquakes occurred in rural areas, relief activities were quite different. This presentation reports and discusses the relief activities in both countries.

**Methods:** An earthquake with a magnitude of 6.2, occurred in northern Afghanistan on 25 March 2002. The JRCS sent Basic Health Care Emergency Response Unit (BHC-ERU) to Afghanistan, and operated an outpatient clinic for two months. The JRCS supported the outreach activities operated by the Afghan Red Crescent Society (ARCS). On 22 June, an earthquake with a magnitude of 6.3 occurred in northwestern Iran. Iranian Red Crescent Society (IRCS) operated well-organized relief activities after the earthquake. The JRCS donated surgical equipment of the ERU, and supported the settlement of a temporary clinic.

**Results:** In Afghanistan, many non-governmental organizations (NGOs) started relief activities immediately, but withdrew gradually. The JRCS, ARCS, and the International Federation of the Red Cross and Red Crescent Societies treated about 3,000 patients from 05 May to 18 June. In Iran, the IRCS established well-organized relief activity quickly. They immediately dispatched search and rescue teams and created health posts for the evacuated people. In case of an emergency, IRCS had to provide care to 600,000 evacuated people (1% of the population) for three months.

**Discussion:** Earthquake relief activities in the two Islamic countries differed. For example, independent NGO activities occurred in Afghanistan and the IRCS led the activi-

ties in Iran. The leading relief systems like IRCS seem efficient for a rural disaster, but in an instance in which many NGOs participate in activities, an organization that coordinates the activities of the NGOs definitely is necessary.

**Keywords:** Afghanistan; clinics; coordination; disaster; earthquake; International Federation of the Red Cross and Red Crescent; Iran; Japanese Red Cross Society (JRCS); non-governmental organizations; relief  
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### Mine-injury Management during UN Mission to the Middle East in Late 2001

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**Introduction:** Since the implementation of the UN Iraq-Kuwait Observation Mission (UNIKOM) after the Gulf War in 1990, a medical team was set-up in 1991 to support the UN Troops in their difficult tasks in the demilitarised zone (DMZ); the DMZ is a remote desert area between Kuwait and Iraq. The mission of the medical team was to provide medical care for the UNIKOM members and for the nomadic people living in the DMZ. (UN reports S/2001/287 and S/2001/913 of the Secretary-General available on the UN web site)

During the first years, the medical duties in this international environment of troops from 33 nations was carried out by an Austrian and later a Norwegian Medical Teams (NORMED). In October 1995, this role fell to Germany; since then, 13 German Medical Teams (GERMED 1 to 13) were responsible providing the emergency medical service (EMS) in the dessert of the DMZ between Kuwait and Iraq.

**Methods:** Beside the usual day-to-day OPD visits for the military and local staff personel, dehydrations, scorpion bites, infectious diseases, road traffic accidents, and mine-injuries were some of the challenges encountered by the GERMED-12 team. This report provides an overview of the EMS experiences during the 6-month period (January 2000 to June 2000) based on the notifications of three precursor missions.

**Results:** The rescue area includes 3,800 sqkm of the DMZ and the remote desert surroundings. Five ambulances from rescue stations with seven paramedics equipped with rescue equipment provide 24-hour duty for the 1,200 UN personal and the nearby nomadic population. There were about 4,000 regular OPD visits and about 50 calls for CASE-VACS served in 2001.

The number of patients, casualties, and mine-injuries treated during the 6-month period was 2,000, 25, and 18 respectively. Treatment guidelines and ICRC classification of the mine injured patients were discussed and compared with the regional epidemiology of previous missions within the medical team, and was accompanied by weekly concurrent medical education and trainings for special situations.

**Conclusions:** The medical challenges in a remote area require the strict cooperation of a medical team with representatives of different disciplines. Accompanying continuous medical education as well as telemedical support in special

situations proved to be helpful.

**Keywords:** education; epidemiology; guidelines; injuries; landmines; medical teams; missions; training  
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### Design of Disaster Decision Making System Using Petri-Net

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From the rescue experience in the 921 Chi-Chi earthquake, it was learned that there is no efficient public wireless communication channel or network system that can collect real time status for decision making after massively destructive disasters. The reports from public media can be biased and result in wrong decision-making in emergency handling. The purpose of this research is to build a disaster decision-making system (DDMS), and to evaluate its effectiveness and performance. Using the system, medical staffs can assess the disaster condition and take appropriate medical care decisions for refugees in the shortest time.

The DDMS consists of a disaster database, wireless network, and dispatch system. The medical staffs can use portable computer systems to transfer and access the patient information to/from the system. The disaster workflow is based on the Petri-Net theories. In combination with the supply and management system (SUMA) concept, the workflow includes the patient's information and all available resources in situ. To evaluate the effectiveness, the DDMS has been tested by the data collected by the Association of Emergency Medical Services at Mass Gatherings. The results showed that through different settings of Petri-Net critical parameters to initiate simulations, users can explore and modify the needs of workflow. The DDMS can be used as an auxiliary decision support system in times of disaster.

**Keywords:** Disaster Decision Making System, SUMA, PDA, Petri-Net  
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