eases of bioterrorism.

Analysis of the responses indicates that a significant portion of community-based, clinical providers lack an understanding of the appropriate treatment, prevention, and reporting mechanisms of diseases caused by Class A agents.

Following the program, important gains in knowledge were observed, at least in the short-term, indicating that educational programs on this topic may be important adjuncts to improving the readiness of clinicians with respect to bioterrorism response.

Keywords: bioterrorism; bioterrorism response; health care workers
Prehosp Disast Med 2002;17(s2):s58-59.

Analysis of Disaster and Emergency Medical Systems in Nuclear Plant Accidents in Korea

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Introduction: There are 18 nuclear power reactors operating in four regions in South Korea that generate more than 40% of the country's total electrical energy. Medical preparedness and response systems for a nuclear plant accident are increasing due to the current terrorism and socio-political environment.

Methods: A questionnaire was distributed to each nuclear plant and related institute, to confirm that inspections were done at the related institutes. Themes studied were: (1) Emergency medical systems in place around the plants; (2) Nuclear disaster medical systems; (3) Transport and communication; and (4) Preparedness and drills to address nuclear event.

Results: Data were obtained from four regions (16 nuclear reactors) and 24 hospitals. Of the related hospitals, one is a central radiation medical center, 12 are region-wide emergency centers, and 11 are hospitals sited close to the plants. The primary Emergency Medical System (EMS) in the nuclear plants was considered to be good when patients were not seriously injured during the daytime, but there are problems with the EMS system when accidents occur during nights or holidays; at such times, the degree of injury is severe, and the number of injured is high. The systems for detecting contamination and for primary decontamination of patients at accident locations were excellent. Except for one central center, receiving centers were not prepared for secondary decontamination screening of contaminated patients. There are guidelines for a nuclear event occurring in each plant, but no individual medical guidelines are in place except in one central center. No hospitals provide education or training programs, except in one central center. Disaster drills have been performed regularly only in the central center and in the plants, but the proportion that focused on medical considerations is relatively low. Most emergency transporting vehicles, including helicopters are not equipped for nuclear protection. Personal protection devices for prehospital personnel only are minimally provided, and those for medical teams, are not available except at one central center. There are no specific medical communication systems between the plants and the hospitals. The communication system depends on regular EMS communication and nuclear disaster communication systems. Basically, primary care during regular times and guidelines and disaster drills in the nuclear plants are acceptable.

Conclusions: For the medical aspects of nuclear disaster preparedness, there is insufficient preparation, especially in the aspect of hospital preparedness, secondary and personal decontamination, medical equipment for nuclear disaster, and specific communication systems. Therefore, efforts to improve medical preparedness for a nuclear disaster in South Korea are necessary.

Keywords: contamination; decontamination; disaster drill; emergency medical systems; Korea; nuclear disaster; nuclear plant; nuclear reactor
Prehosp Disast Med 2002;17(s2):s59.

Decontamination of Injured Persons after Chemical Incidents: Fundamentals and Frontiers

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More than eight years after the Tokyo subway sarin attack, there still are more questions than answers for the management of such incidents in civilian populations. Besides the lack of communication and cooperation of various "forces" during the Tokyo incident, the key problems were the lack of emergency medical support, the absence of a plan of response for the decontamination of CWA victims, and the failure of the rescue teams to protect themselves due to the absence of protective equipment.

Sponsored by the National Fund for Disaster and Civilian Defense, a plan of response with regard to the German emergency medical service and fire fighting structures was established and evaluated. Both the emergency medical service and the firefighters will operate together a decontamination area. In this plan, the necessary personal protective equipment (PPE), material resources, and the complete steps in the patient's "run" are defined. All injured persons must be registered and triaged with respect to their physical condition and their exposure to the chemical substance. During this triage process, an initial treatment of the patients before body decontamination is crucial. This treatment — which consists, for example, of basic life support, spot decontamination of wounds and exposed body areas, and the use of antidotes — will be performed by different teams. After this "pre-treatment", patients will be decontaminated with water depending on their status (litter patients or walking). Behind the "hot line" the regular emergency medical system will care for the patients.

Keywords: chemicals; decontamination; exposure; personal protective equipment (PPE); plan; rescue; treatment; triage
Prehosp Disast Med 2002;17(s2):s59.

Policy Formulation for Disaster Management to Hazard Exposure in the Workplace

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Objectives: To formulate a policy framework for disasters that may emerge from hazard exposures at work.

Methods: This study was conducted among 500 workers in various manufacturing industries. Questionnaires were

distributed to the workers to assess their hazard exposures and their local experiences related to work and industrial hazards, chemical exposures, and their consequent health effects. Interviews and focus group discussions also were conducted.

Results: There was 100% use of chemicals in the industries used as raw material or solvents for processing including toluene, alcohols, lead, and trichloro-and perchloroethylene. The industries generated dust and vapours, as well as acids and caustics. The blood lead levels of the 285 subjects sampled indicated that 40.7% had blood lead levels within the 21–30 ug/dL, which is considered by the Department of Health as inimical to the health of workers. When hazards and illness were correlated with the alpha set at 0.05, radiation exposure was associated with bone pain, and dust exposure with eye strain and viral exposure. Based on the results, a proposed exposure rating instrument for chemical exposure was developed. This tool provides an easy assessment of chemical risks using factors such as contact with the body surface, generation of vapor within the breathing zone, threshold limit values (TLV), and exposure time. For example, exposure rating estimate of "0" means "no" exposure either through dermal contact or within the breathing zone of the worker. "Moderate" exposure is given an estimate of "2", which means an exposure time of less than 50% of the total 8-hour workday. "Very high" exposure is excessive exposure above the TLV that varies by the chemical, and when the exposure time is beyond the 8-hour work duration. The interviews revealed that the terms of employment included lack of social benefits, practice of unfair labor terms like apprenticeship where workers are given only 75% of the minimum wage, forced overtime, piece-rate wage rather than daily minimum wage, and the restriction from organizing labor.

Recommendations: It is suggested that a broad front of strategies coupled by a policy framework for industrial hazard exposures be developed. To fight for social inclusion at work means more involvement of the stakeholders in the development of actions to improve their control of their work, enhanced entitlements to economic and social benefits through policy frameworks of national governments and a thorough democratic alliance of various sectors including the now, so called third sector, so that social objectives are not subjugated to pure economic considerations. Disasters from industrial hazards can be reduced or controlled through the review of labour standards and the engagement of workers themselves through active labour organization to attain levels of safety and health in the workplace.

Keywords: alliance; assessments; chemicals; economics; exposures; framework; hazards; illness; Philippines; policy

Prehosp Disast Med 2002;17(s2):s59-60.

Task Force Session: Disaster Public Health

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Disaster Health Impacts—The Gujarat Experience

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Background: On 26 January 2001 at 08:46 hours, an earthquake struck Gujarat State in the Republic of India. The earthquake magnitude was 7.9 on the Richter scale. The World Health Organization was asked to perform disaster site assessment, and to undertake coordination of external relief activities in the health sector.

Methods: (1) Rapid epidemiological and health facilities assessment; and (2) Expansion of existing polio surveillance into post-disaster syndromic surveillance system.

Results: There were approximately 20,000 deaths and >167,000 persons injured. More than 225,000 homes were destroyed and another 400,000 damaged. The geographic area most affected was Kutch District where all 884 inhabited villages were damaged, and the district hospital and 46 of 47 community and primary health centers were destroyed. Only the tented military hospital remained functional. It performed approximately 1,500 major surgeries and 7,000 minor surgeries within the first 48 hours post-event. Trauma case presentations declined sharply after 72 hours. By the second week post-event, leading causes of morbidity were undifferentiated fevers, acute respiratory infection, and simple diarrhea. Marked deficiencies occurred in solid waste disposal, standardized case management, and epidemic preparedness.

Conclusions: The Gujarat earthquake was the largest recorded in Indian history since the Calcutta earthquake of 1737. The burden of traumatic disease peaked before the arrival of international medical assistance. Locally endemic infectious diseases predominated afterward. Critical decisions in post-event health response relied upon a scaleable disease surveillance system developed from infrastructure and personnel of the existing polio surveillance system.

Keywords: clinics; deficiencies; earthquake; Gujarat, hospitals; India; infectious diseases; medical conditions; polio surveillance system; rapid epidemiological and health facilities assessment; trauma

Prehosp Disast Med 2002;17(s2):s60.

Evidence-Based Tool for Redefining an Approach to Severe Malnutrition in Complex Emergencies

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Introduction: Merlin, an UK Medical Charity, has successfully addressed the individual medical needs of malnourished children in nutritional crises. But, with a commitment to an evidence-based approach to humanitarian aid, Merlin needed to redefine its appropriate response to populations in complex emergencies. The aim of this unique University-non-governmental organization (NGO)