Study/Objective: The aim was to, 1) study the relation between disaster outcomes after earthquakes, expressed as number of dead and injured, and the performance of five pre-identified severity, and risk-scoring indexes, 2) to inform a model that in an initial phase of a disaster can be used to predict severity and levels of need, and thereby guide toward the appropriate levels of response.
Background: A disaster is as an event that overwhelms local capacity, necessitating national or international assistance. Disasters can be categorized, based on the type of hazard causing them. An earthquake is a hazard that can lead to a disaster. The disaster-severity depends on the magnitude of the hazard, underlying vulnerability, the level of exposure, coping capacity and the disaster response. While assistance should be based on needs, determined by the severity of a situation, there is no recognized way to compare severity between disaster contexts. Several initiatives have been developed to provide information on global severity and risks in disaster situations. In this study we compare five indexes and their ability to define severity: GDACs, GEO, KI's 7-need, INFORM and ECHO's Crisis index.
Methods: We did a mapping of the existing indexes and indicators used. Index-scores were standardized and then compared with the number of dead and injured as an absolute outcome, in earthquakes with magnitude equal to or higher than 6,5 that occurred in populated areas, between year 2001 and November 2016.
Results: The five indexes evaluated were all indicating the severity after the examined earthquakes. There was not one single index that gave an absolute correlation. Indexes built on higher numbers of indicators had several indicators that gave identical information.
Conclusion: It is possible to predict the severity of a disaster through proxy indicators. The number of indicators used is not automatically increasing the preciseness or validity of the outcome.

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Enhanced Situational Awareness through a Decision Support Service for Optimal Allocation of Resources and Response Capacity

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Study/Objective: We designed and developed e-services, aiming to support the decision makers during various contexts of medical emergency response, offering them machine-aided enhanced situational awareness.
Background: Currently, decisions are being made by human experts with hands-on experience in emergency fields. However, in most cases, experts do not have the required computational capacity to process the relevant heterogeneous information and perform informed decisions. Evidently, time is a very critical parameter in emergency situations, especially in large-scale incidents with large number of casualties.
Methods: Taking this into account the services we develop, are based on the mathematical modeling of optimization problems for timely resources' allocation, addressing different phases of the response. The formulated problems address: i) the optimal allocation of Emergency Medical Services (EMS) units (in terms of demand satisfaction and time), to active emergency incident fields, ii) the optimal allocation (in terms of exploiting their capacities and response time) of EMS staff to tasks on the incident field such, as triage and retrieval running, transferring of patients to medical treatment area, offering medical treatment, and iii) the optimal allocation (in terms of profile matching, demand satisfaction and time) of patients to EMS vehicles and subsequently to first receivers (hospitals). The services are supported by semantic modeling of EMS vehicles, hospital, staff and patients profiles, as well as by machine learning tools that estimate demand for resources given historical emergency incident data. The services offer clear interfaces, so as to be interoperable with existing emergency management systems, as long as access to the necessary information is given.
Results: Our solution achieves the recommendation on allocation of resources, based on real-time collected information from the emergency field.
Conclusion: Further work will focus on modeling different cost functions in the optimization, so as to customize the recommendations based on incident and/or decision-maker needs.

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Comparison of UAV Technology vs No UAV Technology in Identification of Hazards at a MCI Scenario in Primary Care Paramedic Students

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Study/Objective: The aim of this study was to compare Unmanned Aerial Vehicles (UAVs) to Non UAV technology in hazard identification, using paramedic students during a simulated Mass Casualty Incident (MCI). It was hypothesized that there is no difference in hazard identification order, and time to hazard identification.
Background: The proliferation of Unmanned Aerial Vehicles (UAV) technology has the potential to fundamentally change the situational awareness of incident commanders, allowing greater safety to first responders. Most studies of this technology have been descriptive in nature.
Methods: A randomized, controlled study was conducted with twenty-one students in their first year of a Primary Care

Provider (PCP) program. They were randomized into either a UAV group or a non UAV group. The study scenario was based on a highway accident involving ten vehicles with seven hazards. Each group was given a 60 minute lecture on UAV technology, and a 30 minute lecture on hazards. Each subject entered the scene after receiving a brief narrative. Having been informed that there were 7 hazards to be identified, the UAV group remained at the UAV ground station while the non UAV group was able to approach the scene. After identifying all hazards, the time to identification and order was recorded. Primary outcome measures were the difference in time to identification, and difference in identification order.

Results: The mean time (SD, range) to identify the hazards were 3'68" (1.62, 1'48"-6'48") and 2'43" (0.92, 1'43"-4'38") in UAV and non UAV groups respectively, corresponding to a mean difference of 58" (P = 0.11). A non parametric permutation test showed a significant (P = 0.04) difference in the hazard identification order driven by two hazards, fuel and workplace hazardous material information system placard.

Conclusion: This study demonstrated that there is a statistical difference in the identification order of hazards. Interestingly, preliminary results were unable to identify a difference in time to hazard identification.

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Developing the Chemical Information System Requiring Emergency Medical Information in Disaster

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Study/Objective: The study objective is to make the basis of a chemical emergency medical information system.

Background: There are many database sets and websites which provide chemical databases in chemical accidents, but they don't have adequate roles for emergency medical support in Korea.

Methods: We reviewed the database sets and websites, which provide chemical database and emergency medical records in prehospital transport to hospitals. After an analysis was done, an adequate database set was proposed, and the algorithm for elicitation of chemicals suitable for emergency medical support, accident cases.

Results: By four steps of elicitation of chemicals, the number of chemicals of more than 100,000 was decreased to less than 1,000. The standard steps were accident preparedness, toxicity, and circulating amounts. We made an algorithm for the elicitation of chemicals.

Conclusion: When mass exposure by toxic chemical occurs, chemical emergency medical information systems will be helpful for acute identification of chemical and emergency medical response.

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Thailand's Hospital Awareness in Emergency and Disaster Preparedness (THAI-EDP) Study: A National Survey

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Study/Objective: To determine the nationwide current status of hospital awareness in emergency and disaster preparedness.

Background: Hospital awareness and preparedness is the cornerstone for community health management in emergency and disaster as it plays a critical role in taking care of injured patients. To assess the current system is the first necessary step to improve hospital readiness for emergency and disaster.

Methods: A questionnaire was distributed to every provincial, general, and university hospital in Thailand. The data were extracted and reported as number and percentage. Single logistic regression analysis was used to identify factors related to hospital preparedness. Values were significant when P < .05.

Results: The questionnaire response rate was 112/119 (94%) from hospitals in every province of Thailand. Forty-four percent of the hospitals were general hospitals and 10% were academic hospitals. Only 50% of the hospitals had full-time emergency physicians. Most of the hospitals had risk assessment activities and moderate risk for disaster. An emergency management committee was set up in over 95% of the hospitals while 56% had regularly meetings. Most hospitals had an emergency management plan and sub-plan, an incident command system, triage system, hospital map, communication and staff callback system, mass-casualty incident training, and adequate personal protective equipment. Nearly 60% of the hospitals had a decontamination area and a negative pressure room for patients who are contaminated and have communicable diseases. Hospital preparedness was related to regular meetings of the emergency management committee (P = .005).

Conclusion: Most Thai hospitals are aware of emergency and disaster preparedness, while preparedness of chemical and communicable disease needs to be improved. A regular meeting of an emergency management committee is a predicting factor for hospital preparedness.

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Being Aware of the Situation: Situational Awareness in the Emergency Department

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Study/Objective: To outline the application and benefits of Situational Awareness in the Emergency department. To show the basic aspects of Situational Awareness that can be applied in Emergency care.