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