Despite recent concerns about weapons of mass destruction, explosions are by far the most common cause of disasters associated with terrorism. Of 93 reported terrorist acts producing 30 or more casualties from 1991–2000, 82 (88%) involved explosions. These attacks not only resulted in significant death and destruction, but also challenged emergency medical systems in 27 countries.[1] The largest of these bombings were catastrophic medical disasters, generating hundreds to thousands of casualties, acutely overwhelming local prehospital and emergency department resources.[2]

Emergency physicians play a pivotal role in the immediate medical response to terrorist bombing events. They not only triage, treat, and determine the disposition of immediately surviving injured victims, they also provide prehospital medical control, manage emergency department resources, solve logistical problems, and calm a terrified public. Accordingly, they must understand the mechanisms, types, frequency, severity, and time course of injuries in terrorist bombings, as well as be familiar with the many lessons learned from past responses to terrorist bombing events.

This presentation reviewed the epidemiology of multiple and mass-casualty terrorist bombings, and discusses the implications for emergency department response. Although it is prudent to "expect the unexpected", a rational approach to disaster management incorporates what already is known into the basis for planning and preparedness. As long as terrorists continue to use explosions to achieve their goals, terrorist bombings must remain a focus of medical disaster preparedness.

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Keywords: bombings; emergency departments; emergency management; emergency medicine; epidemiology; explosives; planning; preparedness; response; terrorism
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World Trade Center Tragedy; An Economic Analysis Using YPLL (Years of Potential Life Lost)

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Objective: To analyze the economic loss because of life lost as a result of attack at World Trades Center (WTC) because of terrorist attack on 11 September 2001.
Methodology: The list of people who lost their life as a result of attack on the WTC on 11 September 2001 was analyzed. From this list, the number of the productive life years these victims have lost will be deduced using the age at the time of death from the average age in USA. This number of years lost will put into the YPLL equation to find the loss their families have suffered because of their early demise. Then, the individual life lost and their economic value will be added to determine the total economic loss incurred on the US economy as a result of the attack on the WTC.
Result : The economic impact as a result of life lost on the overall US economy because of that attack on the WTC on September 2001 will be analyzed.

Keywords: economic analysis; terrorism, World Trade Center, Years-of-Potential-Life-Lost
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Forced Displacement: A Disaster in Colombia—The Case of Antioquia!

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Introduction: Forced displacement is the most important disaster in Colombia. The Non-Governmental Organisation, Counsellor for the Human Rights and the Forced Displacement (CODHES) registered 91,166 persons displaced during the first trimester of the year 2001. This is 34,210 more persons than during the previous year.
Objective: To approach the problem of forced displacement in Antioquia.
Method: The Committee for the Integral Attention of Forced Displacement was established to address issues regarding the cause-effect pattern of the displacement relationships and the mechanisms designed to confront the problem, the structure and dynamics of the departmental and local committees, the system of information, training strategies, sensitization, and management.
Results: The process that was generated from the assessment of this disaster has generated a plan for mobilization of great magnitude that has been able to utilize important institutional and social resources to approach the phenomenon. As a result, we have assumed a no-violence attitude towards life.
Conclusion: Attention to the forced displacement in Antiguia has resulted in a non-violent approach that has had positive effects.

Keywords: attitude; Columbia; forced displacement; management; non-violence; sentization; strategies
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Survey and Cost-Analysis of Injuries in the Ji Ji Earthquake in Taiwan

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Objectives: On 21 September, 1999 at 01:47 hours, the Ji Ji Earthquake (Richter Scale of 7.3) struck Central Taiwan near the Nantou area, and caused great loss of life and economy. This paper focuses on the epidemiological survey of the Ji Ji Earthquake to provide data for future epidemiological studies with the goal of preventing disasters globally.
Methods: Information about the Ji Ji Earthquake was obtained from the courses provided by the government and from the Internet. Data of the deaths, injuries, and causes of death were supplied by Department of Health. The

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cases abstracted were limited strictly to victims whose injuries were directly related to the Ji Ji Earthquake, and those who died but whose death was not related directly to the Earthquake were excluded. Geographic and seismographic information, time of origin, location of epicenter, and the depth and magnitude of the Earthquake were obtained from Central Weather Bureau. Department of General Budget, Accounting and Statistics (DGBAS) provided the data for economic loss due to the Ji Ji Earthquake.

Result: There were 2,347 deaths and 11,305 persons were injured in this disaster. Based on the summary of deaths in the stricken areas, Taichung had highest number of deaths (1,777) followed by Nantou (824) and Taipei (132). The epicenter was located, within Nantou county whereas Taichung had the highest number of death. Total economic loss from this disaster has been estimated at US$11.5 billion, including US$8.4 billion in asset loss. The asset loss consists of US$7.9 billion in buildings and equipment and US$0.5 billion in transportation infrastructure. The remaining US$3.1 billion was due to the loss of potential revenues includes US$0.1 billion in agriculture, US$2.3 billion in industry and US$0.7 billion in service.

Conclusion: Traumatic death, the 3rd leading cause of death in Taiwan from 1967 to 1997, was dropped to the fourth place in 1998 due to the implementation of motorcyclists' helmet use law effective on 01 June, 1997. However, the casualties of the Ji Ji Earthquake made trauma the second leading cause of death in Taiwan, only second to cancer in 1999. The data suggest the importance of disaster prevention, which also is a crucial public health issue.

Keywords: cost analysis; disaster; injury, Ji Ji earthquake; Taiwan
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Morbidity Following Chi-Chi Earthquake in Taiwan

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Objective: To observe the characteristics of victims at different areas following Chi-Chi earthquake and provide a view for disaster preparedness in the future.

Methods: A retrospective study of 6,970 victims was conducted during the first three days after Chi-Chi earthquake that caused 8,722 injuries. Medical records were reviewed from the local hospitals, and the characteristics of the victims, visiting day, and diagnoses were collected and analyzed. Additional information was obtained from the government, local Health Bureau, and field hospitals.

Results: On the day of earthquake, there was a sharp increase in the number of the patients (odds ratio = 2.65), most for head injuries (odds ratio = 3.5), and then, declined dramatically on the following days. 80% of patients were clustered around epicenter, Chi-Chi in Nan-tou, but the critics occurred more in Taipei (odds ratio = 1.12), less in Nan-tou (odds ratio = 0.22), the location of epicenter. The elderly were more susceptible to severe injury (odds ratio = 1.67), but not the children. Victims with head injury were more frequent in Taipei (odds ratio = 1.5) and less in Nan-tou (odds ratio = 0.21). Burn patients occurred mostly on the day of earthquake (odds ratio = 1.41), and the children were hurt more (odds ratio = 4.77).

Conclusion: The medical needs following a mass-disaster were recognized. New proposals should be made that will improve patient care in future catastrophes.

Keywords: Chi-Chi earthquake; children; elderly; injuries; odds ratio
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Prediction of the Devastating Effects of a Typhoon—A Prediction Model Based on Logistic Regression

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Objective: Typhoons are the most common natural disaster-producing event in Taiwan. Accurate alarm systems play a pivotal role in mitigation of the damage produced. A statistical model was devised to predict the impact of typhoons.

Methods: The climate characteristics of the typhoons in recent 40 years were collected from the Central Weather Bureau. Their health effects were derived from the official reports of the Department of Interiors. Logistic regression with forward variables selection method was used to build a prediction model for the odds ratio (OR) of a typhoon to cause great loss.

Results: From 1958 to 2000, 205 typhoons were analyzed. A steady decline trend in severity was noted (OR = 0.94). When typhoons approach terrain, great damage ensured (OR = 4.49). Other risk factors included the duration of >48 hours (OR = 4.20) and diameter (OR = 1.007 km). They also contributed to predicting property damage. Other factors including the seasons, categories of intensity, route, and atmospheric depression were not contributory statistically. A prediction model with acceptable sensitivity and specificity was proposed.

Conclusion: Through this proposal, it was possible to predict the impact before attack. More people could be evacuated in time and disaster response resources could be activated and properly allocated. The devastating effects could be alleviated.

Keywords: tropical cyclone; typhoon; logistic regression; prediction model
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Dissater Response/Evaluation

What Have We Learned, So Far?

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Prior to the last decade, reports pertaining to Disaster Medicine were a series of anecdotes and descriptions.

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