

### Validation of the Maurer's Formula to Type and Size the Rescue Resources and Healthcare Needs for Mass Gatherings: The Case of Three Consecutive, Major Air Shows in Western Switzerland

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Three major air shows took place in western Switzerland between 2004 and 2005. Judging by the number of attendees, the site, accessibility and type of gathering, the very important persons' participation, and the police risk analysis, a model of risk evaluation for mass gatherings proposed by K. Maurer was used to determine the type and size of rescue resources and healthcare needs.

The air shows were comprised of: (1) the Swiss Air 04, a three-day, military meeting with 270,000 attendees, 514 medical contacts, and 11 medical evacuations; (2) the Yv'Air 05, a two-day, civilian meeting with 27,000 attendees, 75 medical contacts, and two medical evacuations; and (3) the Centenary meeting of the IAF, a three-day, civilian meeting with 65,000 attendees, 59 medical contacts, and four medical evacuations.

Preparedness for each of these three air shows was planned 4–6 months before their occurrence and called for all partners (police, firefighters, medical and public health services, army, and organizers) to meet the requests of Maurer's model.

According to international statistics for mass gatherings, these three air shows reflected the total number of patient contacts of 1.79/1,000 attendees (range: 0.91–2.78; worldwide average: 0.9–2.6), the total number of medical evacuations of 0.047/1,000 attendees (range: 0.041–0.074; worldwide average: 0.07; range: 0.01–0.55) and no cardiac arrests (worldwide average: 0.25–1/500,000 attendees). No major accidents occurred.

In conclusion, the use of Maurer's model to decide what size and type of rescue resources and healthcare needs were necessary to face these air shows was adequate. The number of medical encounters and evacuations were in accordance with those reported worldwide.

**Keywords:** air show; evacuation; mass gathering; preparedness; Switzerland

*Prehosp Disast Med* 2007;22(2):s65

### Session 2

*Chairs: Paul Arbon; M. Sabbe*

### Three Hundred Heat Casualties during a Walking Trip

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During the Annual International Four Days Marches Event, 45,000 participants walk for four days. Each day they walk thirty, forty, or fifty kilometers (km). Traditionally the marches take place during the third week of July. Many of the participants are well over fifty. In 2006, the marches

were terminated after one day because >300 participants were not feeling well due to the extreme heat. A total of 50 participants were transported to the hospital, and two participants died.

In the presentation the following questions will be discussed:

1. Was there sufficient preparation and awareness for and during the event?
2. Was the weather adequate?
3. What were the consequences for the hospitals involved, and did the "Zirop" work?
4. The decision-making process: why a complete cancellation?
5. How did the participants feel about the incident and what were the results of the evaluation?
6. How should the responsibility be shared: should the government, the organization, or the participants take the appropriate precautions and are adequately prepared?

Finally, an explanation will be provided regarding the lessons learned and how the 2006 experiences will be incorporated into the preparations for 2007. This not only includes the International Four Days Marches Event but also the way in which preparations are made for other events.

**Keywords:** heat injuries; mass-casualty incident; preparedness; responsibility; weather

*Prehosp Disast Med* 2007;22(2):s65

### Prehospital Management of Mass Gatherings in Rome: A Review from the Funeral of Pope John Paul II to the Celebration of the World Football Cup 2006

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**Introduction:** The City of Rome and Vatican State frequently require implementation of the local Emergency Medical Services plan (ARES 118) for events that present a high risk due to high numbers of people attending.

**Objective:** To evaluate a prehospital emergency plan during mass-gathering events.

**Methods:** A specific protocol for health protection was planned for Pope John Paul II funeral (attendance 3,000,000) and other relevant events such as "The White Night" (attendance 1,000,000) and FIFA Football Cup 2006 Celebration (attendance 1,500,000). The activities planned included: preparedness according to other emergencies organizations including the Fire Brigade; command and control; logistic support including the provision of adequate supplies of water, food, and distribution of blankets; setting CCS (Casualties Clearing Station) for patients triaged as levels T1-T2; emergencies special vehicles (motor bike, van, etc.) that were used to implement health facilities on the scene; rescue teams trained to operate in specific sites like ancient Roman ruins or the subway.

**Results:** The results of the application of the protocols for 5,509 casualties includes: (1) an Early Care Response on the scene (89%); (2) pre-hospital, first treatment of patients on the scene (71%); (3) Inappropriate hospital admission (2.3 %); (4) a contamination of health care services for citizen living in the restricted areas (no significant difference in response times).

**Conclusion:** A combination of preparedness activities and application of protocols was useful for providing prehospital medical care during mass gatherings.

**Keywords:** continuity; mass gathering; prehospital protocols; on-scene treatment; preparedness

*Prehosp Disast Med* 2007;22(2):s65–s66

### Subway Accident in Rome, October 2006

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**Introduction:** On 17 October 2006, two trains carrying 1,400 passengers crashed into each other in downtown Rome, near Piazza Vittorio. The accident caused the death of one woman and injured 266 people.

**Objective:** To evaluate the pre-hospital emergency plan of Rome for managing a mass casualty situation.

**Methods:** A prehospital emergency plan specifically for Rome's subway stations was prepared. To evaluate the application of the plan on-scene, a major incident method was applied.

**Results:** The evaluation of the results demonstrated that:

1. safety measures directed at CBRNE situations were successfully applied;
2. Gold Strategic Command and Silver Tactical Command structures were used and included Government Authorities (Emergency General Director—Regional Command);
3. Bronze Command and Communication at the scene were difficult because the accident occurred three floors under street level;
4. good assessments were conducted at the scene according prepared protocols (22 ambulances, Logistic support, and a Casualties Clearing Station (CCS) were operational within 20 minutes; 44 ambulances, two CCS, and six buses were at the scene within the first hour; and 90% of the resources were well-located at the scene);
5. a START Triage method was applied on 116 patients (five red; 19 yellow; 91 green; one black);
6. patients were admitted into 17 hospitals;
7. 150 patients were not transported by the health services and went by themselves to one of two hospitals.

**Conclusion:** The use of a combination of preparedness activities, such as protocols, integration with other organizations, and a regional strategic command, are useful during a mass casualty situation.

**Keywords:** preparedness; regional strategic command; train crash; plans; protocols; START triage

*Prehosp Disast Med* 2007;22(2):s66

### Managing Mass-Casualty Incidents: Protocols or Principles?

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**Introduction:** Mass-casualty incidents (MCIs) require management under conditions of uncertainty. The dynamic nature of the situation—the erratic flow of information and the large number of variables—dictates incident management. Preparing solutions ahead of time and thus, is

complicated by the uncertainty of a future event; its timing, location, characteristics, consequences, magnitude, and response required. For this reason, MCI planning, preparation, and training that is based on rigid, orthodox assumptions may be ineffective or even counterproductive.

**Methods:** The details of 93 terror bombings that occurred in Israel in the past five years were assembled. The range of casualties involved in these MCIs illustrates how difficult it is to draw conclusions for planning based on prior events.

**Results:** The mean number of casualties was 52; the median was 43. The range was between 12 and 160 victims, respectively. The results show that the percentage of severely injured (ISS = 16) was far from constant and ranged from 0 and 100%. Likewise the fatality rate ranged from 0 to 53%.

**Conclusion:** The medical manager of a MCI must approach the event with a high degree of flexibility in order to use all available resources in a manner that will lead to the most successful outcome. Training for the management of MCIs should stress these capabilities and skills.

**Keywords:** Israel; mass-casualty incident; mass-casualty incident planning; percentage of severely injured

*Prehosp Disast Med* 2007;22(2):s66

## Poster Presentations—Theme 7: Mass Gatherings

### (109) Emergency Care Services in Prehospital Intervention for an Uncertain Gas Leak

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**Background:** The impact of a gas leak in Ankara, Turkey, on 10 February 2005, in terms of epidemiologic outcomes, resource utilization, and the time course of emergency needs was estimated.

**Objectives:** The aim was to standardize interventions against chemicals.

**Methods:** All of the events that occurred following notification of the gas leak are presented as a case report.

**Results:** At 11:15 hours (h), the Dispatch Center received a call from Esenboga Airport reporting that two laborers working in the airport had become sick and were transported to Diskapi Hospital, and that a package in the same area would need to be removed. At 11:40 h, the Civilian Defense Team took measures to block entrance into the incident place. The Incident Place Management Team tried to detect the number of people affected and prepared them to change their clothes and be decontaminated. The Domestic Lines Chief offered to remove the contaminated plane away from the others, if not to take away other planes and personnel and control them continuously. It was found that 138 passengers along with cargo had been on the plane. The name and address lists of all passengers were obtained.

**Conclusions:** Incident place management should be conducted by the 112 Emergency Health Service teams. It should be decided ahead of time where and how to make personnel and area measurements. It also was concluded that communication networks should be guided centrally. Warning and quarantine stages, as well as hospital trans-