

### (A274) Mass-Gathering Event Risk Scoring Model: A Score to Predict Risk Level and Medical Usage Rate during Metropolitan Mass Gatherings

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**Background:** During the planning phase of a mass gathering, it is important to organize the most suitable healthcare responses to assure primary, emergency, and major accident care, with the best balance between available resources and costs.

**Objectives:** This study tries to develop a Mass-Gathering Event Risk Scoring Model (MGE-RS) to predict Medical Usage Rate (MUR) that can assist emergency medical services providers in planning for mass gatherings across a variety of events and venue types in a metropolitan area.

**Methods and Results:** This study includes 48 mass gatherings in Rome (35 mass gatherings; 2005–2006) and Milan (13 mass gatherings; 2009–2010). All 35 mass gatherings in Rome had > 100,000 attendees (100,000 to 5,000,000), while the 13 mass gatherings in Milan had a median of 100,000 attendees (50,000–200,000). The median patient presentation rate (PPR) was 0.5 patients/1,000 persons: this rate is close to PPRs for mass gatherings reported in the literature (0.5–2.0 patients/1,000 attendees). For each event, the predicted MURs, calculated using the Arbon Model and the MGE-RS Model, were compared with the actual MUR. The MGE-RS scoring model uses a formula that assigns points based on known information (type of event, place, duration, crowd, health system facilities) to predict the risk. The MGE-RS score ranged from 16 to 77. There are five risk levels, each one corresponds to an expected MUR from 1.5 to 45. In the events studied, the predicted MUR calculated with the Arbon model corresponded in 60% of cases (20% under/overestimation); the MGE-RS was in range in 88% of cases (0% underestimated; 12% overestimation).

**Conclusions:** The MGE-RS seems to be a provider-friendly tool to be used in planning phase, and is able to give an acceptable estimation of the risk level and expected MUR for a mass gathering, without underestimating the estimated MUR during the planning phase.

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### (A275) Experimental Crowd Packing Analysis in Mass Gathering

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**Introduction:** Medical assistance for mass gathering can be classified based on the characteristics of mass gathering into primary or emergency health care for individual patient vs. medical assistance for public in case of disastrous mass gathering. It is necessary to prepare primary and emergency health care in case of routine mass gathering, but when an accident or event occurs, different medical approach will be necessary. One of the representative types of accident or event is crowd packing which can make high pressure among mass gathering participants usually from crowd rush or surge. This study was performed

for identifying the characteristics of crowd packing in mass gathering.

**Methods:** The literature survey was performed on mass gathering and crowd packing. Human model simulation was done as a pilot study and 2-dimensional pedestrian pressure experiment was performed with volunteer students and pressure sensing device by video recording and analysis. Lateral shoulder loading and frontal chest loading were analyzed per load cell and per packed condition.

**Results:** As pushing pressure increased, the body was rotated to 90 degree after some threshold pressure point. The maximal and average pressures among volunteers were extracted. Pedestrian injury criteria(PIC) curve was generated.

**Conclusions:** When crowd packing occurs, the body will be rotated about 90 degree after some threshold pressure point. And then interpersonal pressure will be increased to crush injury as crowd packing proceed. For defining the interpersonal pressure to mortality and critical injury, further research will be needed reflecting real human physiology and anatomy.

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### (A276) Young People at Mass Gathering Events: Data Collection Tools and Findings

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**Background:** During the summer months in Australia, school leavers celebrate their end of school life at Schoolies festivals around the nation. These events are typically described as a mass gathering as they are an organised event taking place within a defined space, which is attended by a large number of people.

**Discussion and Observations:** Two research projects were undertaken to understand the Schoolies phenomenon. The first project was to understand the event as a mass gathering. The second to determine what was important to stay safe and healthy at this event from a young person's perspective. To understand the Schoolies event as a mass gathering Arbons conceptual framework was used which considers the psychosocial, environmental and biomedical aspects of the event. This study found that the crowd mood of the Schoolies were expressive, social and participatory. The environment was bounded, ticketed and dry. The bio-medical data showed a high patient presentation rate when compared to the Australian average. However most of the presentations were minor. What was of concern to the researchers were the high level of risky drinking that took part a this event. The second study used postcards to understand what young people perceived to be important to their health and safety whilst at Schoolies. 3 lead questions were used, and 9 items placed underneath each question to be ranked by participants. Data collected showed that exposure to illicit drugs and violent behaviour where of concern to them. The results from these studies highlights the need to re focus the Schoolies event to be inclusive of strategies that not only support young people to party safely, such as dry zones, but to support young people to feel safe from exposure to drugs, and to violence (physical and sexual) that can occur for many reasons.

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