

**Background:** The Belgian Red Cross provides first aid at 50 events with an attendance of more than 10,000 people every year. Since 2006, every patient encounter gets logged in a database called MedTRIS. The MedTRIS database contains more than 150,000 patient encounters.

**Methods:** The triage category of a patient is recorded upon entering the first aid post. Four categories are used: without treatment, first aid, medical condition and medical emergency. A “medical emergency” requires immediate attention of a physician, a “medical condition/case” can wait. Other patient’s characteristics, such as type of injury and type of event, are also recorded. All recorded information was coded for analysis in SPSS©.

**Results:** 162,611 patient encounters are recorded in the MedTRIS database. 16,989 (10,5%) patients needed medical attention. 1080 (0,8% of total patient encounters) of these patients presented as a medical emergency. In the “medical condition/case” triage category the most prevalent type of injury was of the miscellaneous kind. This category represents -among others- urological and gynecological problems, eye abrasions and patients with chronic conditions. It is worth noting that some of the patients in the miscellaneous category probably belong in one of the other, more specific categories. Other types of injuries such as skin lesions, traumas and intoxications were roughly equally represented. However, in the “medical emergency” category, intoxications were more than three times as common as other type of injuries.

**Conclusion:** True medical emergencies remain infrequent. An on-site physician needs to be capable to treat a multitude of different conditions. However, it is important to note that a medical emergency often concerns an intoxicated patient. Therefore, extra training in this specific type of injury is advisable.

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### The Most Prevalent Injuries at Different Types of Mass Gathering Events: An Analysis of More Than 150,000 Patient Encounters

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**Study/Objective:** To determine the most prevalent injuries at different types of mass gatherings, to optimize the resources available on site.

**Background:** The Belgian Red Cross provides first aid at 50 events with an attendance of more than 10,000 people every year. Since 2006, every patient encounter gets logged in a database called MedTRIS. The MedTRIS database contains more than 150,000 patient encounters.

**Methods:** Upon entering the first aid post at a mass gathering, every patient receives a unique identifier. This identifier can be used to log patient data in a database called MedTRIS. Among the data recorded are the type of event (outdoor music festival, indoor music festival, outdoor Electronic Dance Music (EDM) festival, indoor EDM festival, city festival and sport event) and the type of injury (skin lesions, intoxications, traumas, neurological events, gastrointestinal complaints, cardiac and respiratory

problems and a miscellaneous group). All the recorded information was coded for analysis in SPSS©.

**Results:** There were 162,611 patient encounters recorded in the MedTRIS database. Overall, the most prevalent type of injury are skin lesions (44,6%). The second most prevalent injury is trauma (15,5%). In third place comes neurological symptoms (12,7%), mainly because headaches are represented in this group. Intoxications only represent 3,5% of patient encounters. However, at (indoor) EDM events intoxications are more common and can represent up to 20% of patient encounters.

**Conclusion:** Skin lesions are by far the most prevalent injuries at mass gatherings. As such, the caregivers in the first aid post must be adequately trained in treating this type of injury. However, special considerations must be given to the type of event, especially at indoor EDM festivals where intoxication is more common.

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### Mobile Response by Medical First Responders at a Music Festival

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**Study/Objective:** Music festivals are a subset of mass gatherings prone to high-risk illnesses and injuries requiring dedicated on site medical services. Implementation of a mobile medical response to rapidly reach, stabilize, and transport patients is a major component of safety planning.

**Background:** The delivery of tailored mobile medical care at these types of events has the potential to improve outcomes by enhancing the speed and appropriateness of care to patients.

**Methods:** Mobile first response records were reviewed for a multi-day electronic dance music event. Information reviewed included demographics, call and transport times, chief complaint, acuity, location, and all interventions delivered on scene. Audio recordings of communications and mobile GPS data were also reviewed.

**Results:** 174 mobile responses were catalogued over the 120 hour period. 62 licensed prehospital volunteers served 15,000 attendees over a five-day period. 10% of calls were high acuity, 40% intermediate and 50% low. Peak call volume occurred in an eight hour period from 20h to 04h, with the three busiest hours from 21h to midnight (68% and 41% of all calls respectively). Altered mental status was the most common chief complaint. 79% of patients required transport to medical services and 7% were transported to harm reduction services. The average high acuity patient was reached in 4 minutes, with 8 minutes spent on scene performing targeted interventions. Basic airway manoeuvres and oxygen were the most common interventions required.

**Conclusion:** Response to medical emergencies at a multi-day music festival is aided by a well-prepared and organized mobile first responder program. The goal is to deliver rapid targeted care to the scene as part of the chain of survival. Suitable preparation for first response calls is likely to maximize benefits

and minimize negative outcomes for patients, liability for festival leadership, and impact on local health care resources.

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### First Aid Training and Comfort in Non-Medical Event Staff

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**Study/Objective:** To evaluate whether non-medical personnel feel adequately trained and prepared to act as first responders to potential medical emergencies at a multi-day music festival.

**Background:** Music festivals are a high-risk environment for medical presentations. Although dedicated medical services are often present at such events, non-medical volunteers and staff generally outnumber those with formal medical roles and are more likely to make the first point of contact with attendees in distress. Preparation for foreseeable emergencies makes sound safety sense, and more recently litigation has also underscored its importance in minimizing liability. Using the chain of survival model, the provision of timely first responder care by appropriately trained personnel has the best chance of affecting outcomes by minimizing morbidity, mortality, liability and impact on local health care infrastructure.

**Methods:** This study used an online survey provided to 2,200 non-medical staff and volunteers, at the 2016 edition of a week-long electronic dance music event for 15,000 attendees.

**Results:** A total of 369 personnel participated, of that 87% had direct contact with festival attendees and 85% had some form of formal first aid training. However, only 51% of this training was up to date, 19% had no CPR training at all, and 49% of those who had did not consider it up to date. A majority of respondents felt first aid training would benefit attendees, but that it should not be a requirement for their position. Respondents were receptive to basic and advanced training free of cost. Most felt comfortable acting as a first responder in scenarios dealing with unconscious, agitated, non-breathing or pulseless patients.

**Conclusion:** Preparation of non-medical personnel for medical emergencies at music festivals can potentially increase safety and minimize negative outcomes. Such personnel appear comfortable with first response roles but may need help in maintaining training currency. Results may be applicable to other event types.

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### Effectiveness of Gamification of Mass-Gathering Health Concepts

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**Study/Objective:** To measure the effect of participation in a facilitated, board game-based, tabletop exercise focused on health services planning for Major Planned Events (MPEs).

**Background:** Current best practice for medical care at mass-gathering events involves the integration of event safety plans, on-site health services, and community acute health services into a systematic, coordinated, proactive approach. Unfortunately, as most teams operate in silos, lessons learned from previous event planning and implementation are not often systematically shared. In this study, we assessed the effects of an interactive tabletop gaming exercise on delivery and retention of mass-gathering conceptual knowledge. The use of gamification to deliver medical education is not a novel concept, but rather a well-documented method of engaging learners. Gamification provides opportunities for participants to apply knowledge in a “live-fire” context, to reflect on outcomes critically, and to use feedback and acquired skills to inform future behavior.

**Methods:** A convenience sample of 28 event race directors and 44 medical students were surveyed before and after engaging in a 90-120 minute, interactive, facilitated mass-gathering tabletop exercise. Survey content assessed respondent comfort on a variety of pertinent considerations faced by event planners and medical direction teams. Domains of survey assessment included: attitudes and beliefs surrounding event preparation, event-specific medical knowledge, and event logistics.

**Results:** Comparison of pre- and post-exercise responses revealed that the mean and median comfort in all of the domains assessed improved within both populations. Participants rated this exercise as informative, and identified ways in which new knowledge would be applied at future MPEs.

**Conclusion:** In a convenience sample of race directors and medical students, the use of a facilitated mass-gathering health tabletop exercise is an effective delivery modality for the transmission and integration of knowledge related to the planning and delivery of health services for MPEs.

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### Point of Care Ultrasound at a Remote Multi-Day Mass Gathering: A Prospective Case Series

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**Study/Objective:** We describe a novel application of Point of Care Ultrasound (POCUS) in a remote mass gathering at the 4-day Pemberton Music Festival 2016 attended by over 40,000 participants per day. The objective of this study is to prospectively evaluate the impact of POCUS on diagnosis, management, and disposition of patients.

**Background:** POCUS has become an important tool for hospital-based clinicians. This is the first study characterizing its use at a remote mass gathering where physicians face numerous challenges including limited resources, complex disposition decisions, and dynamic environments.