

understanding as to why patients are transferred to a hospital when an onsite medical team, providing a higher level of care (HLC), is present.

**Aim:** To better understand the causes that necessitate patient transportation to the hospital during festivals that have onsite physician-led coverage.

**Methods:** De-identified patient data from a convenience sample of four, large-scale Canadian festivals (over two years) were extracted. Patient encounters that resulted in transfers to hospital, by ambulance, non-emergency transport vehicle (NETV), or self-transportation were analyzed for this study.

**Results:** Each festival had an onsite medical team that included physicians, nurses, and paramedics. During 34 event days, there were 10,406 patient encounters, resulting in 156 patients requiring transfer to a hospital. A patient presentation rate of 16.5/1,000 was observed. The ambulance transfer rate was 0.12/1,000 of attendees. The most common reason for transport was musculoskeletal injuries (54%) that required imaging.

**Discussion:** The presence of onsite teams capable of treating and releasing patients impacted the case mix of patients transferred to a hospital, and may reduce the number of transfers for intoxication. Confounding preconceptions, patients in the present study were transferred largely for injuries that required imaging. Results suggest that a better understanding of the specific effects onsite medical teams have on avoiding off-site transfers will aid in improving planning for music festivals. Findings also identify areas for further improvement in care, such as onsite radiology, which could potentially further reduce the impact of music festivals on local health services.

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### Prediction Modeling Studies for Medical Usage Rates in Mass Gatherings: A Systematic Review

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**Introduction:** Mass gatherings attended by large crowds are an increasingly common feature of society. In parallel, an increased number of studies have been conducted to identify those variables that are associated with increased medical usage rates.

**Aim:** To identify studies that developed and/or validated a statistical regression model predicting patient presentation rate (PPR) or transfer to hospital rate (TTHR) at mass gatherings.

**Methods:** Prediction modeling studies from 6 databases were retained following systematic searching. Predictors for PPR and/or TTHR that were included in a multivariate regression model were selected for analysis. The GRADE methodology (Grades of Recommendation, Assessment, Development, and Evaluation) was used to assess the quality of evidence.

**Results:** We identified 11 prediction modeling studies with a combined audience of >32 million people in >1500 mass gatherings. Eight cross-sectional studies developed a prediction model in a mixed audience of (spectator) sports events, music

concerts, and public exhibitions. Statistically significant variables ( $p < 0.05$ ) to predict PPR and/or TTHR were as follows: accommodation (seated, boundaries, indoor/outdoor, maximum capacity, venue access), type of event, weather conditions (humidity, dew point, heat index), crowd size, day vs night, demographic variables (age/gender), sports event distance, level of competition, free water availability, and specific TTHR-predictive factors (injury status: number of patient presentations, type of injury). The quality of the evidence was considered as low. Three studies externally validated their model against existing models. Two validation studies showed a large underestimation of the predicted patients presentations or transports to hospital (67–81%) whereas one study overestimated these outcomes by 10–28%.

**Discussion:** This systematic review identified a comprehensive list of relevant predictors which should be measured to develop and validate future models to predict medical usage at mass gatherings. This will further scientifically underpin more effective pre-event planning and resource provision.

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### Proposing a Minimum Data Set for Mass Gathering Health

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**Introduction:** There is currently no standardized approach to collecting mass gathering health data, which makes comparisons across or between events challenging. From 2013 onward, an international team of researchers from Australia and Canada collaborated to develop a Minimum Data Set (MDS) for Mass Gathering Health (MGH).

**Aim:** The process of developing the MDS has been reported on previously at the 2015 and 2017 World Congresses on Disaster and Emergency Medicine, and this presentation will present a final MDS on MGH.

**Methods:** This study drew from literature, including the 2015 Public Health for Mass Gatherings key considerations, previous event/patient registry development, expert input, and the results of the team's work. The authors developed an MDS framework with the aim to create an online MGH data repository. The framework was populated with an initial list of data elements using a modified Delphi technique.

**Results:** The MDS includes the 41 data elements in the following domains: community characteristics, event characteristics, venue characteristics, crowd characteristics, event safety considerations, public health considerations, and health services. Also included are definitions and preliminary metadata.

**Discussion:** The development of an MGH-MDS can grow the science underpinning this emerging field. Future input from the international community is essential to ensure that the proposed