

**Survey of Crowd Crush Disasters and Countermeasures**

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**Introduction:** On the night of October 29, 2022, a crowd crush occurred during Halloween festivities in the Itaewon neighborhood of Seoul, Korea. At least 156 people were killed and at least 173 others were injured. In this study, the author tried to learn a lesson by investigating the worldwide crowd crush disaster and analyzing the differences and results.

**Method:** First, the crowd crush disasters were investigated and summarized through literature and internet searches. Second, based on this, the prevention and management of crowd crush disasters, emergency medical response, and necessary research/development contents were derived through a Delphi survey of experts.

**Results:** Crowd crush disasters have been experienced from developed countries to developing countries since the 1800s. Commonly the crowd density was high, and the crowds continued to move and then the crowd collapsed above a certain limit. The biggest casualty occurred during a pilgrimage to Mecca in Saudi Arabia in 2015, but the theme of the event, such as concerts, sporting events, and funerals, was varied. Experts survey was that the manager's efforts not to increase the crowd density, and efforts to maintain order and prevent contingencies were important. They said that it is important to comply with the principles of disaster medicine, but it is difficult to access the patient in the crowd crush state, so the management of the crowd may be more important. They said that it is necessary to establish a realistic guideline and a real-time crowd density monitoring system using CCTV or drones.

**Conclusion:** Crowd crush disasters can occur in any type of crowd gathering events where the crowd density increases, and prevention through crowd management and real-time crowd density monitoring should be implemented.

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**Triage at Mass Gathering Events: Not an Emergency Department, and Not (Necessarily) a Disaster**

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**Introduction:** Triage at mass gathering events (MGEs) has no standard protocol that is widely accepted and applied uniformly across event types and locations. This investigation describes the current state of published literature as it applies specifically to the triage of patient presentations at MGEs, and identifies key roles and important limitations of triage methods in use at events.

**Method:** A literature review search strategy was employed (previously published, Turrís et al, 2021) to search for event case reports published for the period from 2010-2022. Included papers were reviewed and data were extracted for all references to triage; authors were contacted for any missing details. Data extraction looked specifically for the following (if available): triage mention, triage scale used, triage categories with patient counts, triage training and any information on clinical dispositions subsequent to triage assignment.

**Results:** A total of 60 papers were included (Data extraction in progress, numbers to be finalized for presentation). Of these papers, a minority even made mention of triage, very few specified the triage scale used, and almost none described any triage training. Only a handful of case reports contained counts of patient presentation by triage categories. A couple of papers mentioned triage scales that were event type specific (sports, etc).

**Conclusion:** Published literature to date contains limited details and agreement on triage methods in use at MGEs. Methods are largely from the emergency and disaster domains. Triage utility appears generally to be limited to designating location and provider, and for a snapshot of acuity post event. The use of triage scale has not been solely predictive of the need for transfer to hospital.

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**Football Stampede in Kanjuruhan Stadium from the Perspective of Disaster Preparedness on Mass Casualty Incident: A Case Study of Mass Gathering Event**

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**Introduction:** The lack of planning and coordination by the mass gathering event organizers involving other stakeholders, especially from the health sector, caused mass casualty incidents which could not be managed in a timely manner and resulted in many victims. This was worsened by the fact that the nearest health facilities to the mass gathering event did not have a disaster management plan such as a hospital disaster preparedness plan which, if any, was not operational. No firm regulation forced, monitored, and evaluated the necessity of high-risk mass gathering events to have such a preparedness plan yet in Indonesia.

**Method:** Using a case study qualitative research method by conducting media observations and listening to webinars on experiences with health workers involved in handling the social disaster of the Kanjuruhan tragedy. Supported by analysis of policy reviews and in-depth interviews with the involved stakeholders on the field.

**Results:** This is ongoing research, the results have not been finalized. However, from the information that has been obtained so far, it can be concluded that there is no synergy



between the plans prepared by the football match organizing committee, police, local government, and nearest referral health facilities. This was identified by the absence of a medical director at the referral health facility, the absence of in and out access for the medical team to the mass gathering event location, and the absence of crowd management at the site of the incident resulted in 720 injured and 135 of them dead. This made the incident the second worst football stampede incident in history.

**Conclusion:** Specific mass gathering regulation specific to football matches is required as Indonesia has a risk of hooliganism in some areas. This will be mandatory for the organizing committee to comply with and involve relevant stakeholders, especially the local health sector.

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### Managing Hajj Mass Gathering Throughout the Pandemic

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**Introduction:** The rise of the COVID-19 pandemic caused significant concerns due to the risk of transmission in such mass gatherings. Too many variables for such a critical challenge made it more of a complex situation, with an enormous negative impact on either decision. In this paper, we aimed to summarize the experience of Saudi Arabia in hosting and managing Hajj throughout the pandemic for three seasons, the public health strategies to control the COVID-19 transmission during Hajj, and the policies and regulations that were implemented for the safe return of Hajj.

**Method:** This is a summary of our experience in managing Hajj seasons throughout the COVID-19 pandemic for the period 2020, 2021, and 2022. A description of the factors, models, and tools used to assess the situation for each year, and the bundles of measures followed to mitigate the events aiming to hold a "Safe Hajj".

**Results:** 2020 was a unique year, with the pandemic at its height with no vaccination available. So, the decision was to hold a symbolic strict Hajj of only 1,000 pilgrims residing within Saudi Arabia. In 2021, as the World was easing restrictions and distributing vaccines, around 60,000 internal pilgrims got to perform Hajj, and 2022 hosted one million international pilgrims. That is still 40% of 2019 Hajj with 2.5 million due to considerations to avoid usual overcrowding and mandating COVID-19 full vaccination status.

**Conclusion:** Our experience with the COVID-19 pandemic over the past three years has informed us that huge MGs can be conducted safely during the pandemic if adequate measures were implemented. That would include an accurate and reliable risk assessment to inform policymakers about the most effective strategies.

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### The UK Health Security Agency (UKHSA) Planning, Preparation, and Response to the Birmingham 2022 Commonwealth Games—Learning for Future Mass Gatherings, Including Multi-sport Events

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**Introduction:** The Birmingham 2022 Commonwealth Games (CWG) met the World Health Organization (WHO) definition of a mass gathering: events attended by sufficient people to strain the planning and response resources of a community, state or nation'. It was a key opportunity for the UK in terms of tourism and economy, but a major challenge in terms of the potential for adverse events e.g. infectious disease outbreaks, terrorist attacks. This increased scrutiny and threatened reputational risk. For UKHSA, as a new organization amidst a rapidly changing public health landscape—continued COVID-19 pandemic and increases in Monkeypox, this was a very public test.

**Method:** In 2021, a small team was established to accelerate preparation including:

- assurance structures
- advice to the Organizing Committee and Government departments
- advice on COVID-19 including testing policy
- staff/stakeholder preparation through exercising/training
- increased staff numbers and skill mix able to adapt
- budget
- operational response structure
- plans in place and tested for a health protection response in the event of an incident
- other mass gatherings reviewed for transferable learning enhanced surveillance systems

**Results:** Daily epidemiology reporting provided reassurance that there were no significant public health issues requiring escalation. Enhanced surveillance provided reassurance to the community that there were no population ill effects linked to the CWG. Overall, COVID-19 positivity was low. No outbreaks were detected linked to the CWG.

**Conclusion:** The UKHSA successfully identified, planned and prepared for and mitigated the risks of a mass gathering of 1.5 million people. Early engagement, support, advice and cross-government collaboration has been regarded as exemplary with surveillance data indicating no outbreaks linked to the Games. Despite the breadth of risks visitors were able to attend the event in contrast to the restrictions placed at the Tokyo Olympics. This contributes to the worldwide body of knowledge for planning and delivering mass gatherings – sporting or otherwise.

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### Review of Canadian Legislation on Mass Gathering Medical Response

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