successfully transmitted and considered of sufficient quality to identify acute illness.
Method: Four UAVs equipped with high resolution cameras were deployed at two predefined high-risk areas for medical incidents located within the last 800m of the race. The video footage was transmitted in real-time during four consecutive hours to a remote viewing station where four research assistants monitored it on large screens. Interruptions in live feed transmission and moments with inadequate field of view on runners were documented.
Results: On September 25, 2022, 8,577 athletes registered in the Montreal marathon and half marathon. Out of the eight hours of video footage analyzed (four hours per high-risk area), 91.7% represented uninterrupted live video feed with an adequate view of the runners passing through the high-risk areas. The total interruption time was 22 minutes and 19 seconds, and the field of view was considered inadequate for a total of 17 minutes and 33 seconds. Active surveillance of drone-captured footage allowed identification of two race participants in need of medical attention. Appropriate resources were dispatched, and UAV repositioning allowed for real-time viewing of the medical response.
Conclusion: Live video transmission from UAVs for medical surveillance of runners passing through higher-risk segments of a marathon race for four consecutive hours is feasible. Live feed interruptions and segments with an inadequate field of view could be minimized through practice and additional equipment redundancy.

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Prevention and Preparedness for Mass Gathering Disasters: Our Efforts and Successes in Hyogo, Japan

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Introduction: Both prevention and preparedness are essential to avoid casualties and deaths in mass gathering disasters (MGDs). What countermeasures should be taken?
Method: Retrospective analysis of a MGD at Akashi City Fireworks Festival in 2001; discussion of countermeasures at Kobe Luminarie, an annual light festival to commemorate the Great Hanshin Earthquake. Retrospective analysis of mass casualty incidents (MCIs) between 2003 and 2022 in which the alert function of EMISHP (Emergency Medical Information System in Hyogo Prefecture) was activated. Duration from emergency call to activation of alert function (activation time), number of casualties, and number of destination hospitals were evaluated.
Results: More than 200 persons were injured and eleven people died in the Akashi Fireworks crowd crush. The main cause of this MGD was lack of gateway control and one-way flow control of visitors. With such measures in place, no MGD has occurred at Kobe Luminarie. In the past nineteen years in Hyogo, the alert function has been activated for 288 MCIs, such as vehicle accidents and fires. Activation time ranged from 1 to 73 minutes (median value=12). The casualty count ranged from 0 to 662 (median value=5). The number of destination hospitals ranged from 0 to 54 (median value=2). In all cases, emergency medical coordinators at Hyogo Emergency Medical Center, a principal hub hospital for disasters, directly or indirectly contributed to the medical response, e.g. securing hospital capacity, dispatching doctor-attending cars/helicopters and other medical teams to the scene, sharing information on the MCI between fire departments and hospitals.
Conclusion: Prevention of MGDs requires taking proactive measures, such as gateway restriction and one-way flow control without bottlenecks. Preparedness is made possible by the alert function of EMISHP; it enables smoother patient transport to hospitals and contributes much in securing sufficient time and resources for medical response in MCIs, including MDGs.

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Standards of Medical Planning and Response for Emergency Medical Teams During Mass Gatherings: A Systematic Review

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Introduction: Mass gathering events (MGE), organized or unplanned, can attract sufficient attendees to strain the planning and response resources of the host community, state, or nation, thereby delaying the response to emergencies. MGEs also have the potential to cause a mass casualty incident. But MGE can also lead to improvements in the organization of local emergency medical services or public health that form the legacy of that MGE. Emergency medical teams (EMTs) could be deployed to ensure health security as a surge in MGE. But these EMTs should be built on guiding principles and core standards. However, to the best of our knowledge, there are no standards on medical planning and response during any type of MGE (e.g., sports, religious, or festivals).
Method: A systematic review was performed in accordance with current guidelines, using six databases, namely Medline (via the PubMed interface), Scopus, Embase, Cochrane Library, ScienceDirect, and CINAHL, as well as literature sourced by Google Scholar and The Journal of Prehospital and Disaster Medicine. Studies published on minimum standards or medical planning and response during MGE from 2002-2022, written in English, were selected and assessed for eligibility by two reviewers.
Results: From a total of 20,159 articles, 138 were screened, and 32 were assessed for eligibility. Two were only abstracts, and the others did not contain any description of minimal standards available for medical planning or response in different types of MGE.