Although there were no major health alerts during the Olympic Games, the sanitary surveillance of this event should leave a useful legacy: knowledge of relevant indicators or systems for early detection of signals during a mass gathering, providing timely reassurance to health authorities to contribute to preventive or control measures, and fluid communication between public and Olympic stakeholders.

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A Ragdoll Physics Simulation for Analyzing Human Crowd Crush Dynamics

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Introduction: Human crowd crushes are catastrophic events where dense gatherings can lead to severe injuries and fatalities. Understanding crowd behavior and biomechanics is crucial for developing effective prevention strategies, such as eliminating bottlenecks and ensuring ingress and egress. Given the infeasibility of real-world trials, simulations are useful to examine crowd disasters. This study reports the results of a simulation that analyzes human behavior and injury patterns during a crowd crush by incorporating variable crowd densities and trajectories using ragdoll physics principles.
Methods: This simulation was developed with ragdoll physics using the Unity Simulation Engine (Unity Technologies, 2023, San Francisco, USA). A custom-built virtual environment modeled a crowd crush incident and included three groups, each consisting of 500 individuals, converging from the left, right, and perpendicularly in a "T" junction. Pedestrians walking at speeds averaging 1 meter per second were randomly assigned. A series of 30 simulation trials was run with 1,500 pedestrians per trial. The number of injuries and fatalities was recorded.
Results: A crowd simulator was successfully generated, allowing users to create groups with specific sizes, routes, and speeds, with visualization of humanoid subjects. The mean number of injuries was 191.6 (±18.75 SD), with a median of 191.5 injuries per trial and an interquartile range (IQR) of 182 to 206.5 injuries. For fatalities, the mean was 63.1 (±8.56 SD), with a median of 62 fatalities per trial and an IQR of 55.25 to 68.75 fatalities.
Conclusion: The ragdoll physics simulation provides valuable insights into biomechanics, injuries, and fatalities associated with human crowd crushes. This tool has the potential to help improve crowd management protocols. Future research will focus on refining the model and its application in real-time crowd monitoring systems.

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Toxicologic Cardiac Arrests at Music Festivals: Is It Time for a Tailored "One T" Approach to Management?

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Introduction: In undifferentiated cardiac arrest, the "5Hs and 5Ts" approach has been the cornerstone guiding advanced care and management. In recent years, however, more streamlined and targeted approaches have been posited for specific subsets of arrests where a single H or T is likely to be the cause. Specific Hs and Ts — for example, traumatic arrest, drowning (hypoxia), and hypothermia, to name just a few — have each enjoyed tailored approaches and algorithms that inform the sequence and dictate care to focus on high-yield diagnostics and interventions that are context-specific and depart somewhat from standard ACLS algorithms.
Methods: This systematic review examines the potential for developing a focused algorithm for recreational toxicologic arrests at music festivals.
Results: The evidence supporting specific interventions (e.g., airway support, antidotes, deviation from standard ACLS medications) is reviewed, and the primary considerations (toxidrome, substances used, presenting rhythm, etc) affecting decision-making are summarized for the tailored management of cardiac arrest related to recreational substance use at music festivals.
Conclusion: Cardiac arrests at music festivals would benefit from a tailored approach to high-yield management, medications, and interventions based on substances ingested, presenting toxidrome, and presenting cardiac rhythm. There is a need for further research on this subject to bolster the evidence for deviation from standard Advanced Cardiac Life Support (ACLS) practices, as a tailored toxicological approach would likely confer significant benefits to patient outcomes.

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Interdependence of Public Safety Services at a Music Festival - Medical and Sanctuary

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Summary: Harm reduction services are becoming increasingly prevalent at music festivals, aiming to support the health and safety of attendees. Sanctuary zones — also known as psychedelic crisis, chill, or trip sitting spaces — allow care for select cases provided by skilled peer providers. To date, the benefits of and for medical and sanctuary services, working synergistically, and the benefits to attendees have not been explored.

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