



Stampede Mitigation

For Prelims: [Hypoxia](#), [Hypercapnia](#), [Kumbh Mela](#), [NDMA](#), [Disaster Management Act, 2005](#), [LiDAR](#).

For Mains: Disaster Management, Strategy to address stampede.

[Source: TH](#)

Why in News?

Recently, a **surprise appearance** by a Telugu actor led to a [stampede in Hyderabad](#), that again revived the concerns related to **crowd management and stampede** in India.

What is a Stampede?

- **About:** A stampede is a **sudden, uncontrolled rush** of a large crowd of people or animals, typically triggered by **panic, fear, or excitement**.
 - It occurs in crowded areas where **high density of people** restricts movement, causing **chaos and potential casualties**.
- **Causes:** Stampedes are caused by **human, infrastructure, and organizational factors**.
 - **Human Factors:**
 - **Panic or Fear:** Sudden fear (e.g., of a **fire, explosion, or perceived threat**) can trigger **mass hysteria** (uncontrollable fear or anxiety).
 - **Excitement or Euphoria:** Overwhelming enthusiasm, such as during **concerts or celebrations**, may lead to loss of control.
 - **Impatience or Aggression:** Frustration due to **long waits, delays, or limited access points** can cause people to push and shove.
 - **Poor Infrastructure:**
 - **Overcrowding:** Insufficient space increases the risk of crushing and trampling.
 - **Insufficient Facilities:** Narrow paths, **blocked exits, or lack of barriers** create bottlenecks.
 - **Adverse Conditions:** **Slippery floors, poor lighting**, or uneven ground increase the chance of falling.
 - **Organizational Factors:**
 - **Inadequate Crowd Management:** Lack of trained personnel to control or direct crowds.
 - **Insufficient Planning:** Poor venue design, **limited entry/exit points**, or inadequate emergency planning.
 - **Failure in Communication:** Absence of clear instructions leads to confusion and panic.
- **Cause of Death:** During a stampede, **crushing pressure on the chest** restricts the ability of the **diaphragm (base of lungs)** to contract and expand properly. The body **cannot take in enough air or expel carbon dioxide**.
 - This leads to [hypoxia](#) (lack of oxygen) and [hypercapnia](#) (excess carbon dioxide), both of

which are life-threatening conditions.

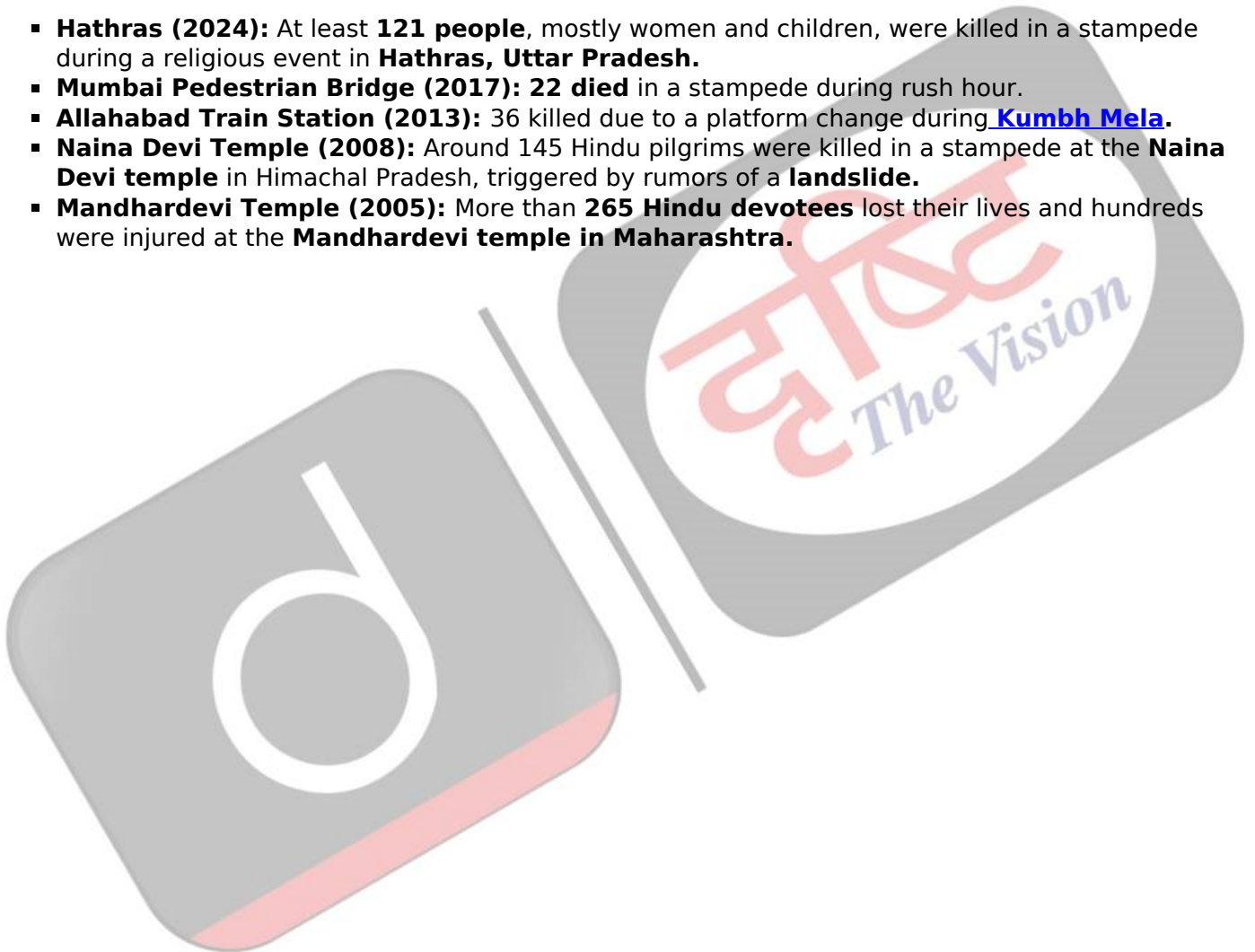
▪ **Impact:**

- **Physical Impacts:** Stampedes can result in **high fatality rates**. It often results in **bruises, fractures, and broken bones** due to people being pushed, trampled, or crushed.
- **Psychological Impacts:** Stampede survivors or witnesses may experience psychological trauma, [Post-Traumatic Stress Disorder \(PTSD\)](#), anxiety, panic attacks, and long-term emotional scars.
- **Legal Impacts:** A major stampede can prompt calls for **stricter regulations** and improved crowd management for enhanced safety standards for public events and gatherings.
- **Impact on Infrastructure:** It can **damage physical infrastructure**, including barriers and buildings, leading to significant repair and upgrade costs.

Deadly Stampedes in India

- **Hathras (2024):** At least **121 people**, mostly women and children, were killed in a stampede during a religious event in **Hathras, Uttar Pradesh**.
- **Mumbai Pedestrian Bridge (2017):** **22 died** in a stampede during rush hour.
- **Allahabad Train Station (2013):** 36 killed due to a platform change during [Kumbh Mela](#).
- **Naina Devi Temple (2008):** Around 145 Hindu pilgrims were killed in a stampede at the **Naina Devi temple** in Himachal Pradesh, triggered by rumors of a **landslide**.
- **Mandhardevi Temple (2005):** More than **265 Hindu devotees** lost their lives and hundreds were injured at the **Mandhardevi temple in Maharashtra**.

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Tragic Stampedes

Hathras crush among deadliest stampedes at religious gatherings

162

Naina Devi temple, Bilaspur, Himachal Pradesh
Aug 3, 2008

121

Religious congregation, Hathras, Uttar Pradesh
Jul 2, 2024

250

Chamunda Devi temple, Jodhpur, Rajasthan
Sept 30, 2008

63

Ram Janki temple, Pratapgarh, Uttar Pradesh
Mar 4, 2010

340

Mandhardevi temple, Satara, Maharashtra
Jan 25, 2005

115

Ratangarh temple, Datia, Madhya Pradesh
Oct 13, 2013

● No. of deaths

106

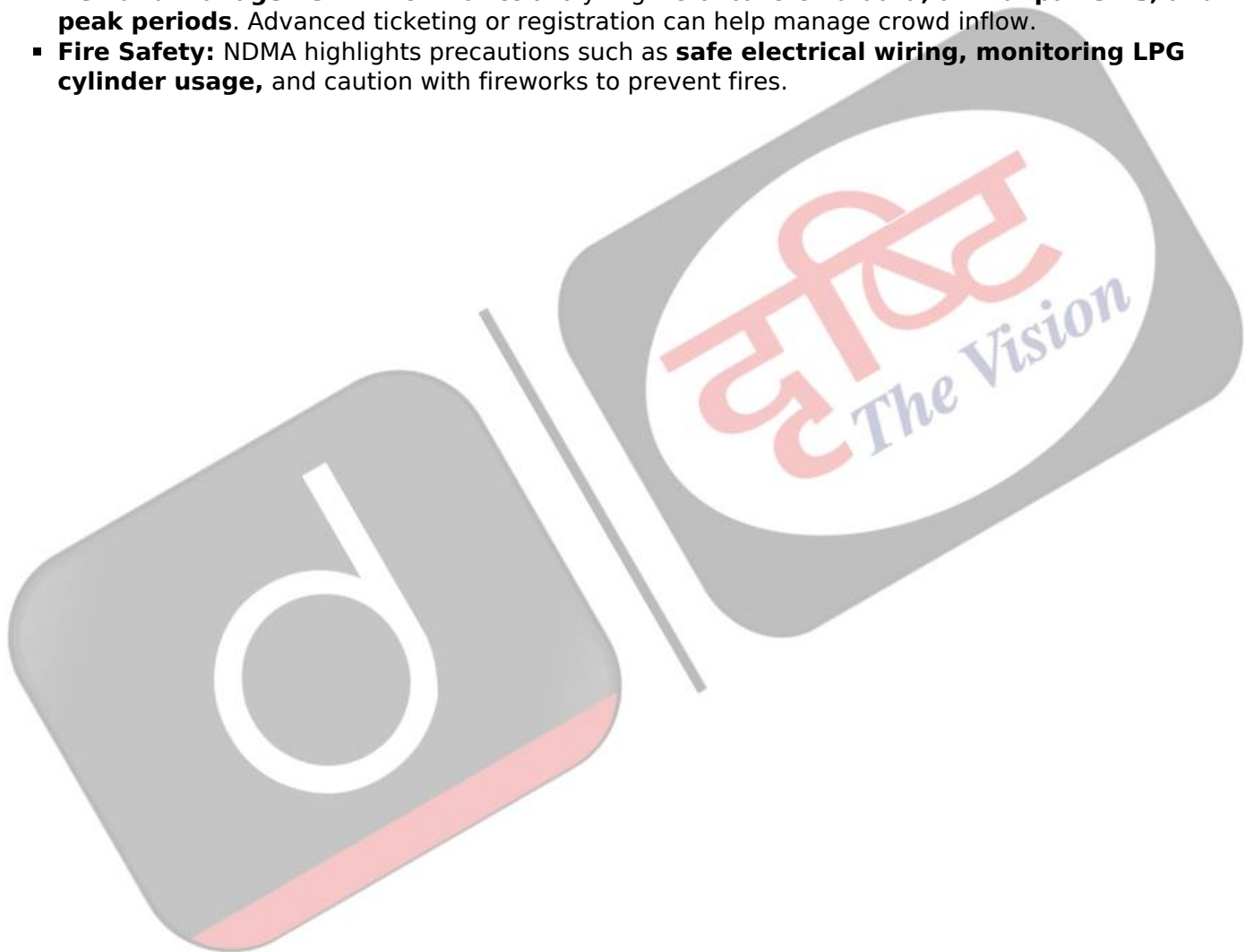
Sabarimala, Idukki, Kerala
Jan 14, 2011

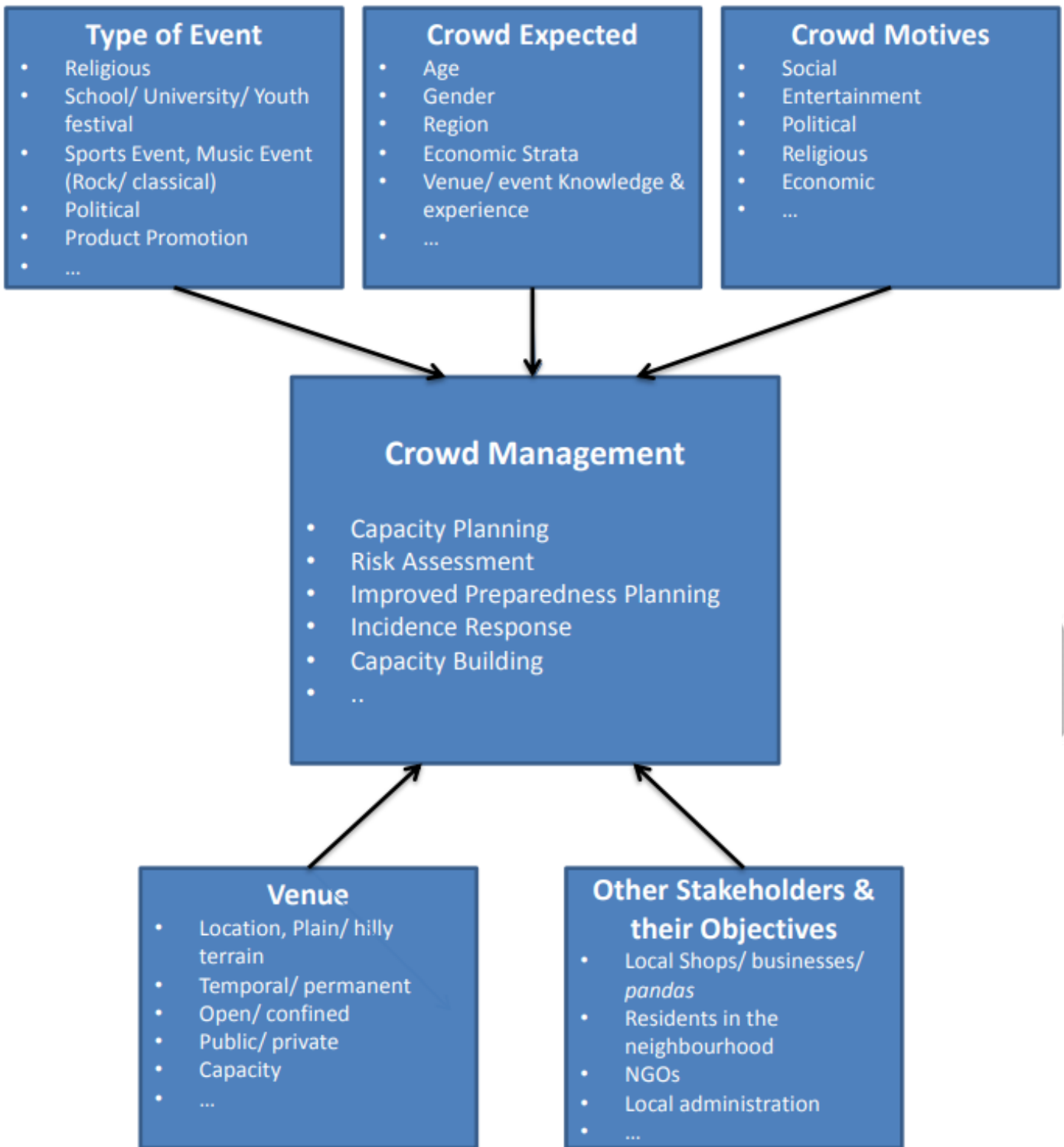
Note: Stampedes since 2000 where more than 50 people died have been mapped

Source: Media Reports & NIDM

What are NDMA Guidelines to Control Stampedes?

- **Infrastructure Development:** Ensuring venues and access routes can **handle large crowds**, especially in disaster-prone areas like **hilly terrain and narrow pathways**.
 - Encouraging separate routes for **normal, express, and emergency flows** helps manage the movement of vulnerable groups like **children, the elderly, and the disabled**.
- **Panic Management:** In case of incidents like **rumors or sudden events** (e.g., a loud noise), the NDMA advises **quick intervention** by trained personnel to prevent stampedes.
- **Crowd Control:** The NDMA advocates a **community-based approach** to crowd control, focusing on **clear communication** and understanding rather than relying solely on force.
- **Demand Management:** This involves analyzing historical **crowd data, arrival patterns, and peak periods**. Advanced ticketing or registration can help manage crowd inflow.
- **Fire Safety:** NDMA highlights precautions such as **safe electrical wiring, monitoring LPG cylinder usage**, and caution with fireworks to prevent fires.





National Disaster Management Authority (NDMA)

- **About:** [NDMA](#) headed by the **Prime Minister of India**, is the country's highest **statutory body** for managing disasters.
- **Establishment and Purpose:** It was **established under the [Disaster Management Act, 2005](#)** to build institutional mechanisms at both the **State** and **District levels** for effective disaster management.
- **Responsibilities:** NDMA is tasked with **formulating policies, plans, and guidelines** for disaster management, emphasizing **prevention, mitigation, preparedness, and response**.
- **Vision and Goals:** The authority aims to create a **safer** and **disaster-resilient India** through a **proactive** approach and **sustainable development** strategies.

Way Forward

- **Live Crowd Tracking:** Deploy **thermal and LiDAR sensors** to track crowd density, feeding data into AI models to predict surges and trigger early warnings.
- **Communication Tools:** Install **interactive displays** showing wait times, evacuation routes, and information in multiple languages.
- **Lighting and Pathway Systems:** Implement **crowd-responsive lighting** that adjusts brightness and color based on density to guide movement or calm situations.
 - Use **bioluminescent pathways** that glow brighter during emergencies to guide movement in low light.
- **Public Awareness and Education:** Launch campaigns to **educate the public on crowd safety protocols** and appropriate behavior at large gatherings.

Drishti Mains Question:

Discuss the major causes of stampedes and suggest effective measures to prevent such incidents.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Mains

Q. Discuss the recent measures initiated in disaster management by the Government of India departing from the earlier reactive approach. (2020)

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