

Stampede and Disaster Management

Context:

- The **RCB parade in celebration of the team's maiden IPL win in 18 years** turned into tragedy as **at least 11 fans died and several were injured** in a **stampede** near the **Chinnaswamy Stadium** on **Wednesday, June 4, 2025**.



1. What is stampede?

- A stampede is an **act of mass impulse** among a **crowd** of people in which they **collectively begin running** with **no clear direction** or purpose.
- In general, the term human stampede is applied to a **sudden rush of a congregated, active, polarized group of people**, which is basically heterogeneous and complex, resulting in many injuries and **death** mainly due to **suffocation** and **trampling**.
- The **worst stampede** in recorded history took place in **Chongqing, China**, during **World War II**. The **Japanese Bombing** of the city on June 6, 1941, **triggered mass panic** at an air raid shelter, **killing** approximately **4,000 people**, most of them by suffocation.
- In India, as well, many incidents of stampedes have occurred in the past.


2. Enlist types of stampedes?

- **K.M. Ngai**, along with other researchers, has **classified human stampedes** into **two main types** based on the nature of movement: **unidirectional and turbulent**.

Types of stampede	Analysis
Unidirectional Stampede	<ul style="list-style-type: none">• Unidirectional stampede events may occur when a crowd moving in the same direction encounters a sudden positive or negative change in force which alters its movement.<ul style="list-style-type: none">▪ A positive force can be a “sudden stop” situation like a bottleneck and blocked exit.▪ Whereas a negative force would be something like a broken barrier or column which sends a group of people tumbling.

<p>Turbulent Stampede</p>	<ul style="list-style-type: none"> • Turbulent stampede events can occur in situations with uncontrolled crowds, induced panic, or crowds merging from numerous directions.
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3. What were the causes of the RCB parade stampede?

Causes	Analysis
<p>Overwhelming Crowd Size</p>	<ul style="list-style-type: none"> • The M. Chinnaswamy Stadium has a seating capacity of approximately 35,000. • However, estimates suggest that between 200,000 to 300,000 fans gathered outside the stadium, far exceeding its capacity. • The overwhelming turnout, combined with inadequate crowd control measures, contributed to the tragic outcome. 
<p>Free passes</p>	<ul style="list-style-type: none"> • The RCB, in the X post at 3:14, also announced limited free passes for the stadium event, available online, which led to a rush for access.

Royal Challengers Be... @RCBTweets

Follow


RCB Victory Parade: Today at 5 pm IST.

Victory Parade will be followed by celebrations at the Chinnaswamy stadium.

We request all fans to follow guidelines set by police and other authorities, so that everyone can enjoy the roadshow peacefully.

Free passes (limited entry) available on shop.royalchallengers.com

- Initially, passes were issued, but the **authorities later declared free entry for all.**
- What followed was a **massive crowd surging toward the gates of the stadium.**
- Fans, both **with and without passes, attempted to enter,** overwhelming the **limited entry points.**

<p>Inadequate Crowd Control Measures</p>	<ul style="list-style-type: none"> • The event lacked sufficient planning for crowd management.  <ul style="list-style-type: none"> • Fans surged toward the stadium gates, leading to bottlenecks and panic.
<p>Poor Communication and Last-Minute Changes</p>	<ul style="list-style-type: none"> • There was confusion due to last-minute announcements and a lack of clear communication regarding entry points and event schedules, exacerbating the situation.
<p>Limited Access Points</p>	<ul style="list-style-type: none"> • Fans attempted to enter through a small number of gates, causing congestion and making it difficult for emergency services to respond promptly.
<p>Insufficient Security Presence</p>	<ul style="list-style-type: none"> • Despite the massive turnout, there was an inadequate security presence to manage the crowd, leading to uncontrolled surges and eventual stampede.



4. Enlist the timeline of the RCB parade stampede?

How it transpired

Eyewitnesses said thousands of fans were trying to scale walls, fences, to make their way inside the packed stadium. A look at what transpired, according to eyewitnesses and officials.

11 DEAD

47 INJURED

★ Stampede reported

1 **Around 4.30PM**
100,000 people
assembled at Vidhana Soudha on Dr Ambedkar Rd to welcome the team. There, players are felicitated by Karnataka chief minister Siddaramaiah

2 **Around 5.30PM**
Team heads to the stadium, reaching around 6.30pm. The team bus leaves around 6.30pm after the tragedy unfolds

At M Chinnaswamy Stadium

1 **2pm: Crowdings**
Thousands of people start arriving at the M Chinnaswamy Stadium ahead of the team's arrival

2 **Around 3pm: Stadium packed**
Shortly after entry is allowed, nearly all seats in the stadium are filled

3 **Around 3pm: Gates barred**
With thousands still outside, gates of the stadium, filled to capacity, were shut

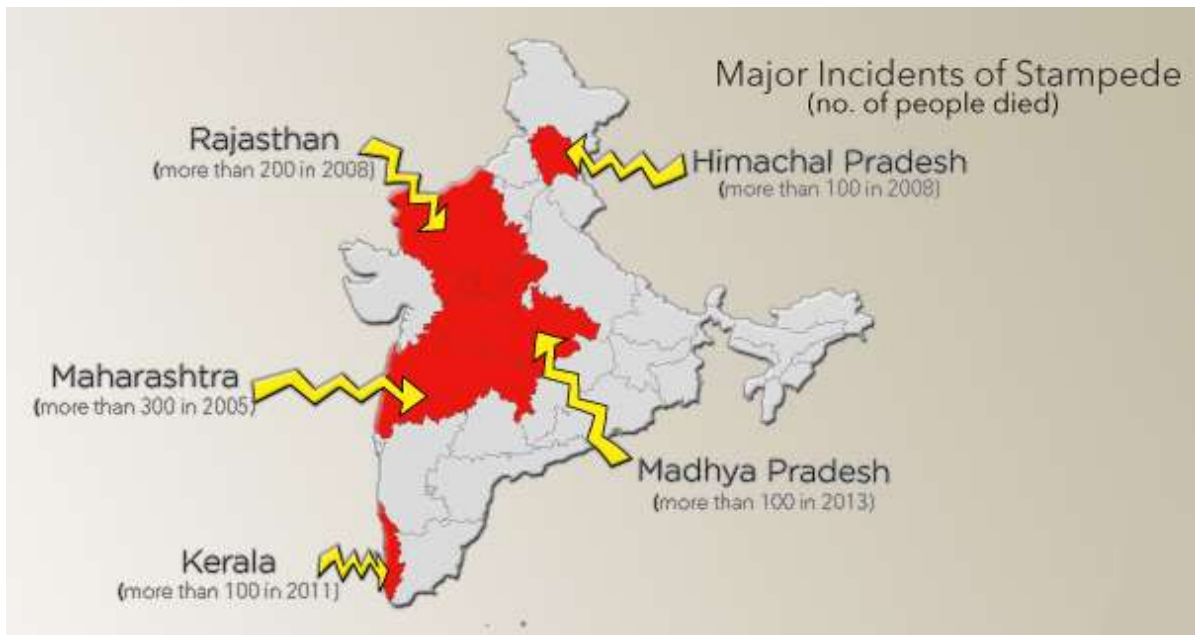
4 **3.30pm onwards**
3 gates (Gate 3, 12 and 18) saw a huge crush as people got tried to enter the stadium

5 **Over the next 2 hours,** reports emerge of casualties. Ambulances rush to the scene. Initially two deaths are confirmed, with toll climbing to 11

Timings	Events unfolded
2:00 PM	<ul style="list-style-type: none"> • Early crowd build-up <ul style="list-style-type: none"> ▪ Thousands of fans began arriving at M Chinnaswamy Stadium hours before the event. ▪ Anticipation was high as RCB was set to celebrate its maiden IPL title with a public victory parade.
3:00 PM	<ul style="list-style-type: none"> • Stadium reaches full capacity <ul style="list-style-type: none"> ▪ Shortly after gates were opened, the stadium reached its full seating capacity. ▪ Officials subsequently closed the gates to prevent further entry.
3:00 PM Onward	<ul style="list-style-type: none"> • Gates shut, chaos erupts <ul style="list-style-type: none"> ▪ With tens of thousands still gathered outside, three main gates Gate 3, Gate 12, and Gate 18 were shut. ▪ Unable to enter, fans began pressing forward, causing panic and overcrowding at the barricades.
3:30 PM	<ul style="list-style-type: none"> • Stampede occurs <ul style="list-style-type: none"> ▪ As fans tried to force their way in, a deadly crush unfolded. ▪ Several people were trampled, and many more suffered injuries in the chaos.
4:30 PM	<ul style="list-style-type: none"> • Massive gathering at Vidhana Soudha: <ul style="list-style-type: none"> ▪ Around 100,000 people assembled at Dr Ambedkar Road near Vidhana Soudha to greet the RCB team. ▪ The team was felicitated by Karnataka Chief Minister Siddaramaiah before proceeding to the stadium.



5. Enlist major stampedes that took place in India?



Major Stampedes	Description
May 3, 2025	<ul style="list-style-type: none"> • Six persons died and around 100 people injured in a stampede in the early hours during an annual festival of Sri Lairai Devi temple at Shirgaon village in Goa.

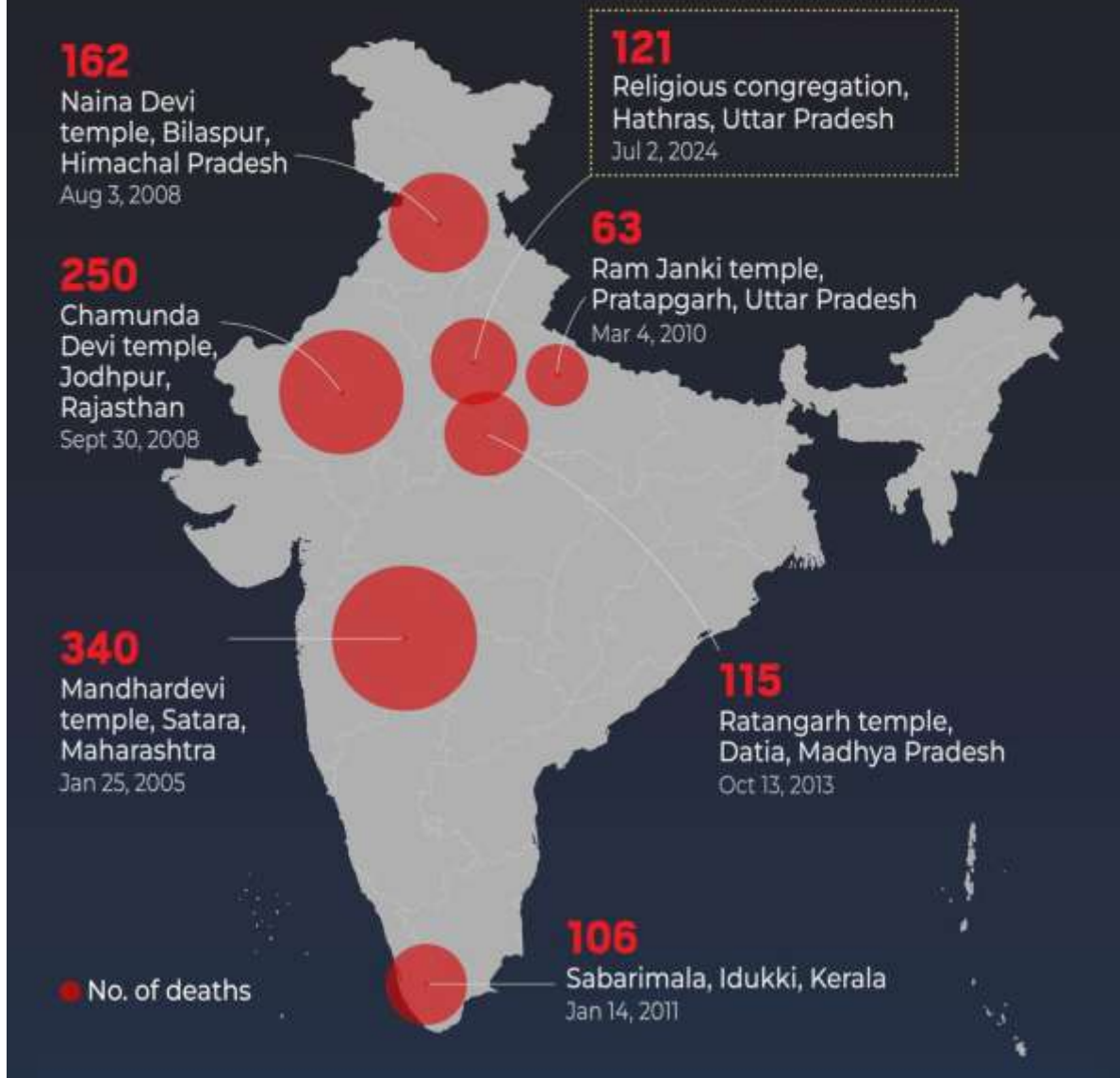
<p>February 15, 2025</p>	<ul style="list-style-type: none"> • A tragic stampede occurred at New Delhi Railway Station, resulting in the deaths of at least 18 individuals and injuries to 15 others. • The incident took place on platforms 14 and 15, where overcrowding was exacerbated by delayed trains and confusion over train schedules. • The crowd surge was primarily composed of devotees traveling to the Maha Kumbh Mela in Prayagraj.
<p>January 29, 2025</p>	<ul style="list-style-type: none"> • During the Maha Kumbh Mela in Prayagraj, a stampede led to at least 30 confirmed deaths and approximately 60 injuries. • The disaster occurred in the early hours as pilgrims rushed to bathe at the confluence of the Ganges, Yamuna, and Saraswati rivers. • The situation escalated when a barrier broke, causing a massive crowd surge. • Some reports suggest the death toll may be higher, with estimates ranging up to 79 fatalities.
<p>January 8, 2025</p>	<ul style="list-style-type: none"> • At least six devotees were killed and dozens injured in a stampede as hundreds of them jostled for tickets for Vaikunta Dwara Darshanam at Lord Venkateswara Swamy temple in Tirumala Hills.
<p>July 2, 2024</p>	<ul style="list-style-type: none"> • At least 121 people, including women and children, were killed after a stampede broke out at a 'satsang' (prayer meeting) organised by self-styled godman, Bhole Baba aka Narayan Saakar Hari, in Uttar Pradesh's Hathras.

<p>March 31, 2023</p>	<ul style="list-style-type: none"> • At least 36 people died when the slab constructed on top of an ancient 'bawdi' or well collapsed during a 'havan' ceremony held on the occasion of Ram Navami at a temple in Indore city.
<p>January 1, 2022</p>	<ul style="list-style-type: none"> • At least 12 people died and over a dozen were injured in a stampede at the Mata Vaishno Devi shrine in Jammu and Kashmir triggered by a heavy rush of devotees.
<p>September 29, 2017</p>	<ul style="list-style-type: none"> • Twenty-three people lost their lives and 36 were injured in a stampede on the narrow bridge connecting the Elphinstone Road station of the Western Railway with Parel station of the Central Railway in Mumbai.
<p>July 14, 2015</p>	<ul style="list-style-type: none"> • Twenty-seven pilgrims died and 20 others were injured in a stampede at a major bathing spot on the banks of the Godavari river where a huge crowd of devotees had gathered on the opening day of 'Pushkaram' festival in Rajahmundry in Andhra Pradesh.
<p>October 3, 2014</p>	<ul style="list-style-type: none"> • Thirty-two people were killed and 26 others injured in a stampede at Gandhi Maidan in Patna, shortly after the Dussehra celebrations ended.
<p>October 13, 2013</p>	<ul style="list-style-type: none"> • 115 people were killed and over 100 injured in a stampede during the Navratri festivities near Ratangarh temple in Madhya Pradesh's Datia district. • The stampede was triggered by rumours that a river bridge the devotees were crossing was about to collapse.

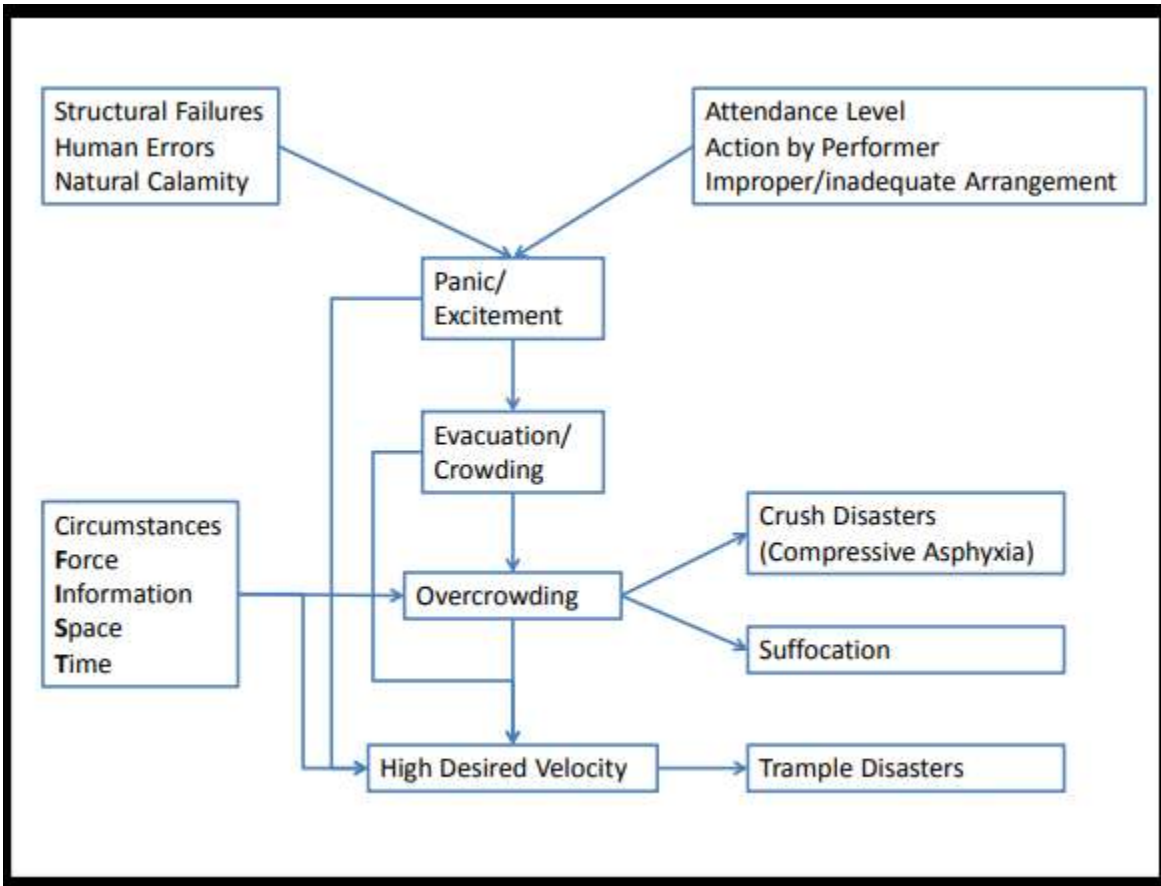
<p>January 14, 2011</p>	<ul style="list-style-type: none"> • At least 104 Sabarimala devotees were killed and over 40 were injured in a stampede when a jeep crashed into homebound pilgrims at Pulmedu in Kerala's Idukki district.
<p>September 30, 2008</p>	<ul style="list-style-type: none"> • Nearly 250 devotees were killed and over 60 injured in a stampede triggered by rumours of a bomb going off at Chamunda Devi temple in Rajasthan's Jodhpur city.
<p>August 3, 2008</p>	<ul style="list-style-type: none"> • 162 dead, 47 injured in a stampede triggered by rumours of rockslides at Naina Devi temple in Himachal Pradesh's Bilaspur district.
<p>January 25, 2005</p>	<ul style="list-style-type: none"> • Over 340 devotees were trampled to death and hundreds injured during an annual pilgrimage at Mandhardevi temple in Maharashtra's Satara district. • The accident occurred when some people fell down on the steps made slippery by the devotees breaking coconuts.
<p>August 27, 2003</p>	<ul style="list-style-type: none"> • 39 people were killed and around 140 injured in a stampede during the holy bath at the Kumbh Mela in Maharashtra's Nashik district.

Tragic Stampedes

Hathras crush among deadliest stampedes at religious gatherings



6. What are the causes of stampedes in India?



Causes	Analysis
<p>Structural</p>	<ul style="list-style-type: none"> ● Structure collapse of: <ul style="list-style-type: none"> ▪ Barricades/ bamboo railings/wire fence/Metal barrier. ▪ Makeshift bridge ▪ Temporary structure ▪ Railings of the bridge caused by panic triggered by rumours ● Narrow and very few entry/exits. ● Absence of emergency exits.

<p>Fire/Electricity</p>	<ul style="list-style-type: none"> ● Fire in a makeshift facility or a shop. ● Fire at illegal structures. ● Non-availability of fire extinguisher/fire extinguishers not in working condition. ● Building and fire code violations. ● Electricity supply failure creating panic and triggering a sudden exodus.
<p>Crowd Control</p>	<ul style="list-style-type: none"> ● More than anticipated crowds at stores, malls, political rallies, examinations, religious Gatherings and public celebrations. ● People were allowed in excess of holding capacity due to overselling of tickets for an event. ● Limited holding area before the entrance. ● Lack of access control. ● Uncontrolled parking and movement of vehicles. ● Lack of a proper public address system to control crowds.
<p>Crowd Behaviour</p>	<ul style="list-style-type: none"> ● A wild rush to force the way towards entrance/exits. ● Crowds attempting to enter a venue after the start/closing time. ● A collision between large inward flows and outward flows. ● Scramble to get event tickets.

	<ul style="list-style-type: none"> • Rumours of a landslide caused by rains leading to rush down a narrow stairway. • Unruly and irresponsible crowd behaviour. • Rush during distribution of disaster relief supplies.
<p>Security</p>	<ul style="list-style-type: none"> • Under deployment of security personnel to regulate the crowd • Lack of adequate scientific planning in making police arrangements to deal with crowds with proper sectoral deployment under an officer with adequate manpower and each sector reporting to the senior police personnel in charge of the police arrangement. • Lack of proper wireless deployment. • Lack of adequate observation towers with PA system and backup force with proper wireless communication with the tower to monitor and regulate the crowd. • Lack of adequate CCTV surveillance of the crowd
<p>Lack of Coordination between Stakeholders</p>	<ul style="list-style-type: none"> • Coordination gap between agencies (e.g. Commissioner/Superintendent of Police and District Magistrate; PWD, Fire Service, Forest officials, Revenue officials, Medical officers and shrine management etc.) • Lack of understanding of the range of duties entrusted.

7. What is the role of human psychology in stampedes?


The Psychology of the Herd



- **Human psychology** is an important factor **leading to stampedes**, as all stampedes are either triggered or made worse by panic.
- In a seminal paper, **psychologist Alexander Mintz theorised** that in **panic-producing** situations, **cooperative behaviour is needed for success** and is rewarding to individuals as long as everybody cooperates.
 - However, once the **cooperative pattern of behaviour is disturbed**, cooperation ceases to be rewarding to the individuals. (*“Non-adaptive group behaviour,” 1952*).
- Some stampedes may also be triggered by what **sociologist Neil J. Smelser** is referred to as a **“craze.”**
 - In **Theory of Collective Behaviour (1962)**, he defined the term *craze* as *“mobilisation for action based on a positive wish-fulfilment belief.”*
 - This belief can be **rational or irrational**.
 - But in large group settings, it **percolates to every member and can make them act in the detriment of their interests**.

8. What are the impacts of stampedes?

Impact	Analysis																																
<p>Loss of Human Lives</p>	<ul style="list-style-type: none"> • Stampedes often cause mass deaths due to suffocation, crushing, and panic-driven injuries. <ul style="list-style-type: none"> ▪ Example: 2015 Hajj Stampede (Mina, Saudi Arabia) – Over 2,400 people lost their lives. <div style="text-align: center;"> <p>DEATHS CAUSED BY STAMPEDE</p> <p><small>*NCRB data for 2015 cites over 380 deaths in stampedes in Jharkhand. But media has not reported such a high toll from stampedes for that year</small></p> <table border="1"> <thead> <tr> <th>Year</th> <th>Deaths</th> </tr> </thead> <tbody> <tr><td>2001</td><td>30</td></tr> <tr><td>2002</td><td>44</td></tr> <tr><td>2003</td><td>83</td></tr> <tr><td>2004</td><td>31</td></tr> <tr><td>2005</td><td>346</td></tr> <tr><td>2006</td><td>18</td></tr> <tr><td>2007</td><td>75</td></tr> <tr><td>2008</td><td>434</td></tr> <tr><td>2009</td><td>110</td></tr> <tr><td>2010</td><td>113</td></tr> <tr><td>2011</td><td>489</td></tr> <tr><td>2012</td><td>70</td></tr> <tr><td>2013</td><td>400</td></tr> <tr><td>2014</td><td>178</td></tr> <tr><td>2015</td><td>480*</td></tr> </tbody> </table> <p><small>Source: NCRB; Media reports</small></p> </div>	Year	Deaths	2001	30	2002	44	2003	83	2004	31	2005	346	2006	18	2007	75	2008	434	2009	110	2010	113	2011	489	2012	70	2013	400	2014	178	2015	480*
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<p>Psychological Trauma in Survivors</p>	<ul style="list-style-type: none"> • Many survivors develop PTSD, anxiety, and a fear of crowded places. • Studies show long-term distress, including claustrophobia and fear of public spaces. 																																
<p>Damage to Infrastructure</p>	<ul style="list-style-type: none"> • Uncontrolled crowds can destroy barriers, bridges, and temporary structures. 																																

	
<p>Social & Religious Disruptions</p>	<ul style="list-style-type: none"> • Fear of stampedes can reduce participation in religious gatherings and festivals, affecting social cohesion and cultural traditions.
<p>Financial Losses & Compensation Costs</p>	<ul style="list-style-type: none"> • Governments and organizers face huge financial burdens due to compensation payouts and security upgrades. <ul style="list-style-type: none"> ▪ Example: Maha Kumbh Mela (2013) – ₹18 crore paid in compensation after 36 deaths.

9. Why do stampedes kill?



- Most **stampede casualties** are caused by **traumatic asphyxia** leading to **partial or complete cessation of respiration** due to **external compression** of the **thorax and/or upper abdomen**.
- Other possible reasons for stampede-related deaths include **myocardial infarction** (heart attack, caused by decreased or complete cessation of blood flow to a portion of the heart), **direct crushing injury to internal organs**, **head injuries**, and **neck compression**.

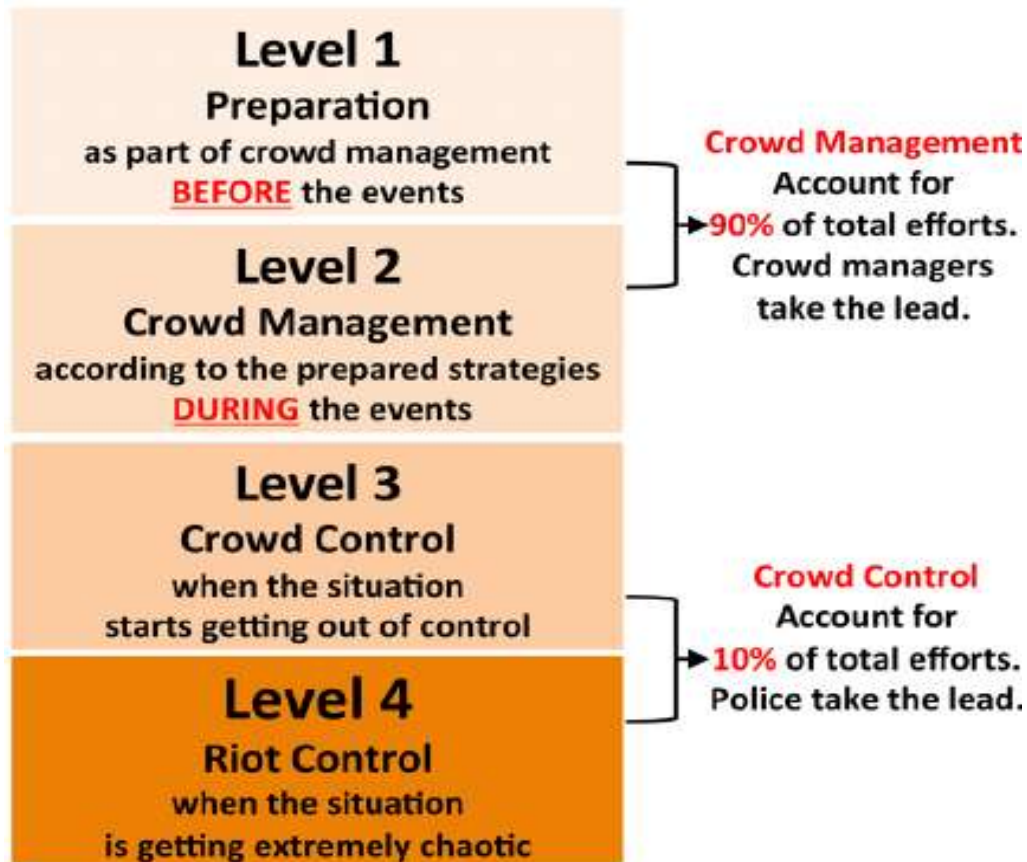
10. Why are stampedes common at religious gatherings?



- According to a 2013 study published in the ‘International Journal of Disaster Risk Reduction’, 79% of stampedes in India occur during religious gatherings and pilgrimages.
- The risk of stampedes is heightened by the location of many major temples on hills, riverbanks, or other uneven terrains.
- Additionally, the tradition of large religious gatherings in rural areas often sees thousands of devotees gathering in cramped spaces, which lack basic facilities such as proper entry and exit points for emergencies.
- In 2005, at Maharashtra’s Mandhardevi temple in Wai, a stampede led to the death of more than 340 devotees.
- In Rajasthan’s Chamunda Devi temple in 2008, at least 250 people were killed due to the stampede.

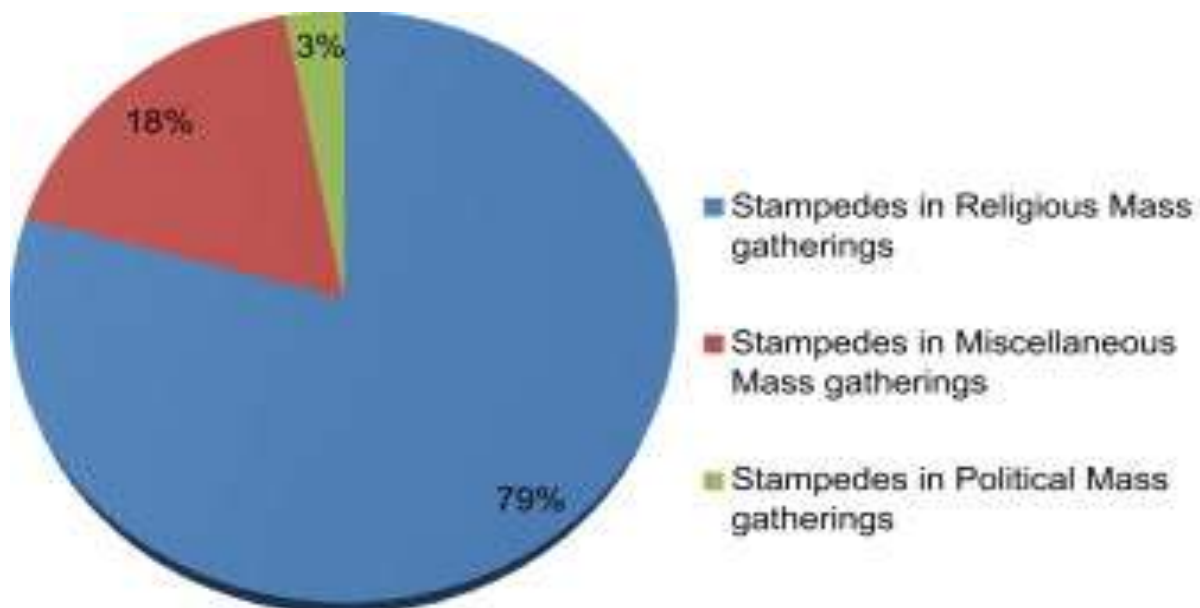
- In another stampede at a religious gathering at **Naina Devi temple in Himachal Pradesh in the same year, 162 people died.**

11. What is crowd management?



- **Crowd management** encompasses a **range of activities** and **measures** aimed at **controlling, directing,** and ensuring the **safety** of large gatherings of **people.**
- It involves **meticulous planning, coordination, and implementation of strategies** to prevent overcrowding, **maintain order, and respond effectively** to any emergencies that may arise.

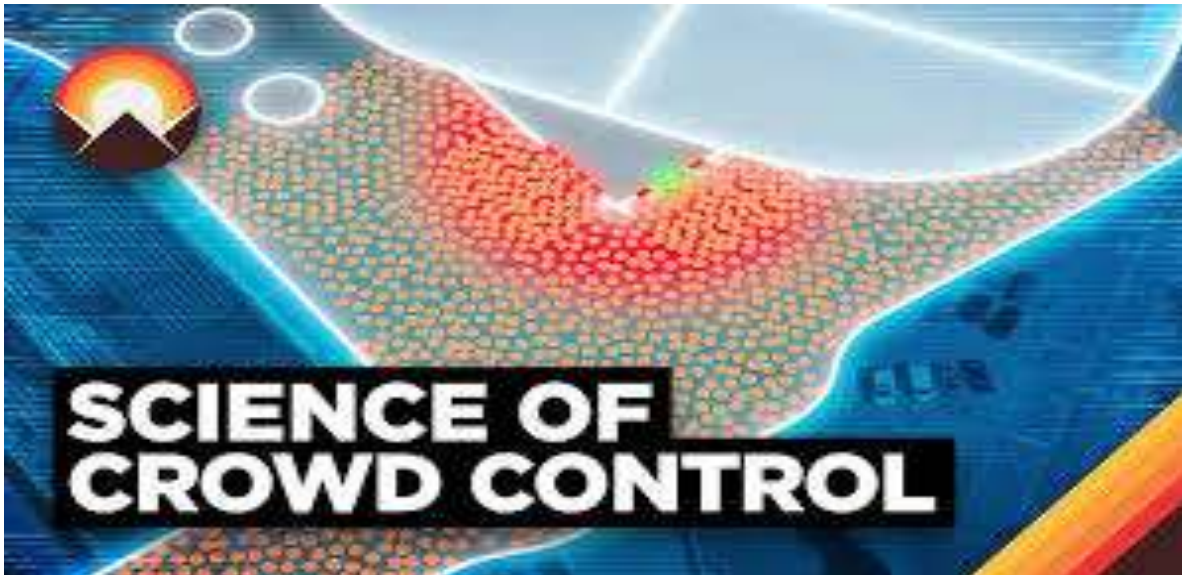
12. Enlist different types of crowd?



Typology	Analysis
Entertainment Crowds	<ul style="list-style-type: none"> Entertainment crowds are gatherings that come together for shared recreational activities. They can include music concerts, sports events, and cultural festivals. These crowds are characterized by a relaxed and enjoyable atmosphere, where individuals seek entertainment and shared experiences.
Political Crowds	<ul style="list-style-type: none"> Political crowds form when individuals gather to express their political opinions and positions. They may assemble in protests and public demonstrations to demand change or voice support or dissent on specific political issues. This type of crowd is characterized by political passion, enthusiasm, and a desire to influence and bring about change.

<p>Religious Crowds</p>	<ul style="list-style-type: none"> • Religious crowds gather for religious and spiritual purposes. • They can involve participation in communal prayers, religious festivals, pilgrimage, and visits to sacred religious sites. • This type of crowd is characterized by religious devotion, spirituality, and communal connection with the religious community.
<p>Emergency Crowds</p>	<ul style="list-style-type: none"> • Emergency crowds form in situations of emergencies and natural disasters or tragic incidents. • Individuals gather in these crowds to seek safety, support, and assistance. • Managing emergency crowds requires rapid and effective organization to guide individuals and provide necessary aid.
<p>Social Crowds</p>	<ul style="list-style-type: none"> • Social crowds include everyday public gatherings that involve people in their social lives. • They can include markets, parks, restaurants, and other social occasions. • This type of crowd is characterized by ordinary social interaction and engagement among individuals.

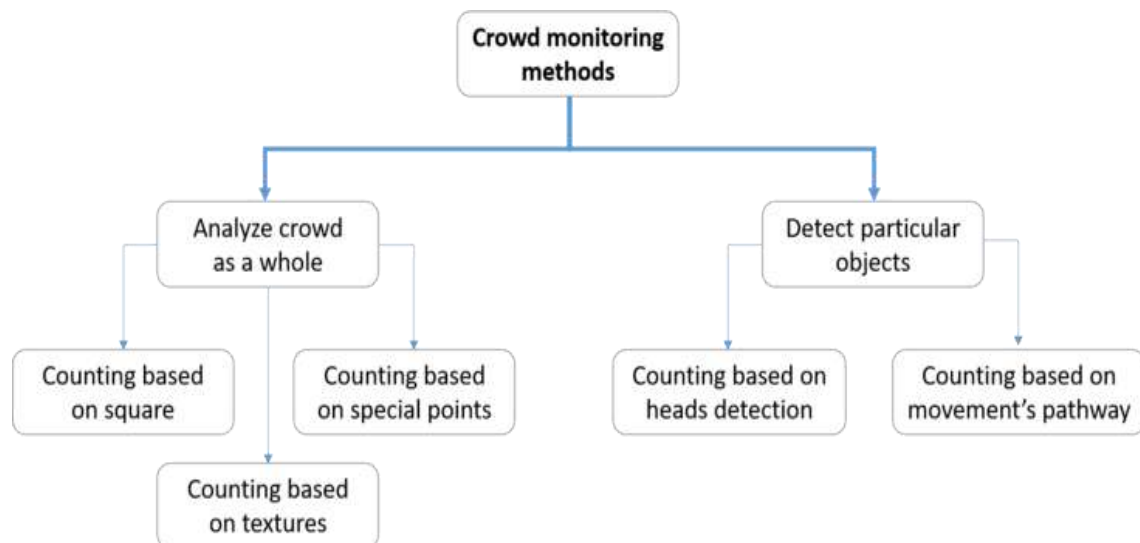
13. What science tells about crowd control?

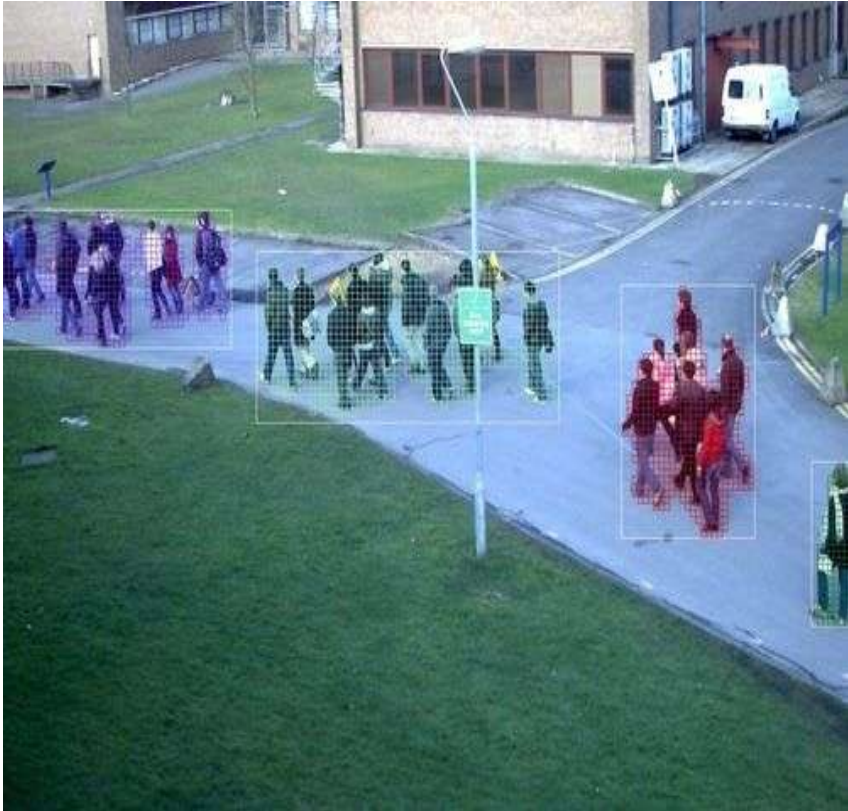


- **Stampedes** are recurring tragedies in India, but a study by **French and Spanish researchers** suggests that **patterns** emerge in **tightly packed crowds**.
- The correct identification of these **oscillations**, and monitoring via **drones** and **CCTVs**, can ensure **crowd control** and **safety** during **mass gatherings**, it says.
- Published in **Nature** in February, the study analysed **video footage** from Spain's **San Fermin festival**, popular for its **running of the bulls** event held in July every year.
- Researchers found that when crowds reached a certain **density**, spontaneous and **rhythmic patterns** emerged.
- Termed '**collective oscillation**', the crowd **self-organised**, and began forming involuntary large-scale, **wave-like patterns**.
- In an interview to The New York Times, France-based physicist **Dr. Denis Bartolo**, who co-authored the study, said that he placed **cameras** across the plaza to film the **movements** of the crowd below.
- At first, it seemed "**erratic, chaotic, turbulent**". But Bartolo and his team applied fluid dynamic techniques to "measure the flow of a material by inspecting its **direction** and **velocity**".

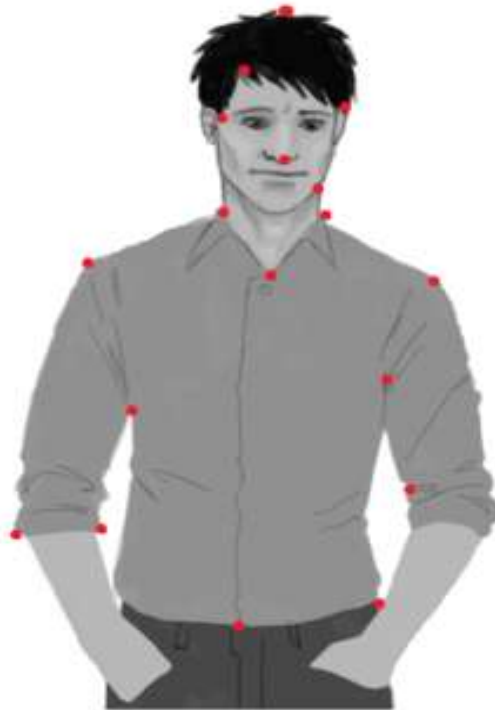
- Similar **orbital motions** which took **18 seconds** to complete in that particular plaza were detected right before a **stampede** that took place at the **2010 Love Parade** in Duisburg, Germany, the study shows.
- The researchers found that above a **critical density** of people, these **oscillations** emerge almost **organically**, without any external guidance.
- These oscillations are caused by **random interactions** between people, a slight **nudge** to gain space, a **shuffling of feet**, or even an adjustment of posture.
- These “**odd frictional forces**” provide a sort of **collective quality** to the crowd, leading the mass to exhibit properties similar to **fluids**.
- By mapping where and when **oscillations start**, organisers of mass events can use **monitoring tools**, like **drones** or **CCTVs**, to identify areas in the crowd before a **disaster** occurs.
- If these **circular motions** are detected, the relevant action can be taken, thereby **averting stampede-like situations**.
- Recognising that **patterns form** right before **stampede-like events** is the first step to building effective **crowd management techniques**.

14. How is crowd density calculated and monitored in large gatherings?



Methods	Description
<p>Counting based on square</p>	<ul style="list-style-type: none"> • This crowd monitoring method uses motion detectors to identify and analyze areas with moving people by detecting pixel changes and outlining crowd contours. • It estimates the number of individuals by dividing the total moving area by the area typically occupied by one person, adjusting for perspective and varying person sizes. • Overlapping individuals are accounted for by analyzing pixel density and calculating an overlap ratio. • The method achieves about 70% accuracy, with results heavily dependent on the quality of the motion detector.  <p>The image shows an aerial view of a crowd of people walking on a sidewalk. Several semi-transparent colored boxes (purple, green, red) are overlaid on the crowd, representing the motion detector's detection of moving areas. The background includes a grassy area, a building, and a white van parked on the street.</p>

Counting based on special points



- The **special points method** estimates crowd size by detecting areas in an image where color gradients peak, often at **body corners** or **clothing contours**.
- It counts these **points in moving areas** and estimates the number of people by comparing them to an **average number of points per person**.
- However, this **average varies** due to factors like **overlap, lighting, and camera settings**, making the method dependent on **calibration** with other techniques like **square footage analysis**.
- As a result, its **accuracy** relies heavily on both **crowd movement** and the **precision** of the **complementary methods** used for **training**.

<p>Counting based on textures</p>	<ul style="list-style-type: none"> • This method analyzes crowd images by detecting structured patterns formed by dense gatherings within a large surveillance area. • It estimates the number of people by examining the frequency and arrangement of these crowd pattern elements. • Although it has a high margin of error (around 50%), it is useful for rough estimates in large-scale mass events.
<p>Counting based on heads detection</p>	<ul style="list-style-type: none"> • This method estimates crowd size by detecting and counting head images in each frame using a trained classifier. • Heads are chosen as the reference because they are usually visible and have a consistent shape, even in overlapping crowds. • The algorithm also adjusts for perspective to improve accuracy.
<p>Counting based on head images</p>	<ul style="list-style-type: none"> • This head-counting method requires high-resolution images, as head sizes must fall within specific dimensions, otherwise, accuracy drops, especially in dense or complex backgrounds. • Errors can occur from mistaking round objects for heads or missing heads entirely, often leading to underestimation. • To improve accuracy, this method is combined with the area-based method, and the average of both results is used for a more balanced crowd count.

<p>Counting based on movement's pathway</p>	<ul style="list-style-type: none"> • This method, used with a Tracking module, analyzes movement patterns, builds pathways, and creates a movement direction map to count individuals in a defined area. • It achieves high accuracy by focusing on motion rather than images, allowing it to detect and separate people even in dense, overlapping crowds. • The uniqueness of individual movement helps distinguish and count each person effectively.
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15. Enlist the issues of Crowd Management?

- There are **four types** of conditions that can create crowd management problems.

Conditions	Description
<p>Problems created by a crowd from within</p>	<ul style="list-style-type: none"> • These issues arise due to the behavior, psychology, or physical actions of individuals within the crowd. • When large numbers of people gather, especially in emotionally charged or religious settings, individual actions can quickly ripple through the crowd.
<p>Problems created by a crowd from outside</p>	<ul style="list-style-type: none"> • External threats or disruptions, intentional or unintentional can destabilize an otherwise calm crowd. • The crowd, unaware of external factors, may react with fear, confusion, or anger.

	<ul style="list-style-type: none"> • Poor communication from organizers can aggravate the situation, leading to chaos or bottlenecks.
<p>Environmental catastrophe</p>	<ul style="list-style-type: none"> • Natural or infrastructural events can severely endanger crowds, especially in open or poorly sheltered locations. • Extreme heat, heavy rain, lightning, or structural collapses (like footbridges or tents) can trigger mass movement. • A crowd in panic may rush in one direction, leading to trampling, falls, or suffocation.
<p>Rumor</p>	<ul style="list-style-type: none"> • Rumors spread quickly in crowds, especially where information is scarce or anxiety is high. • A false alert about a fire, bomb, or animal presence can cause immediate panic. • The crowd's reaction is often irrational and driven by fear. • Stampedes, fights, or stamp-like movements occur, making it nearly impossible for officials to restore order quickly.

16. What are the challenges in crowd management?



How to Survive a **Stampede** ?

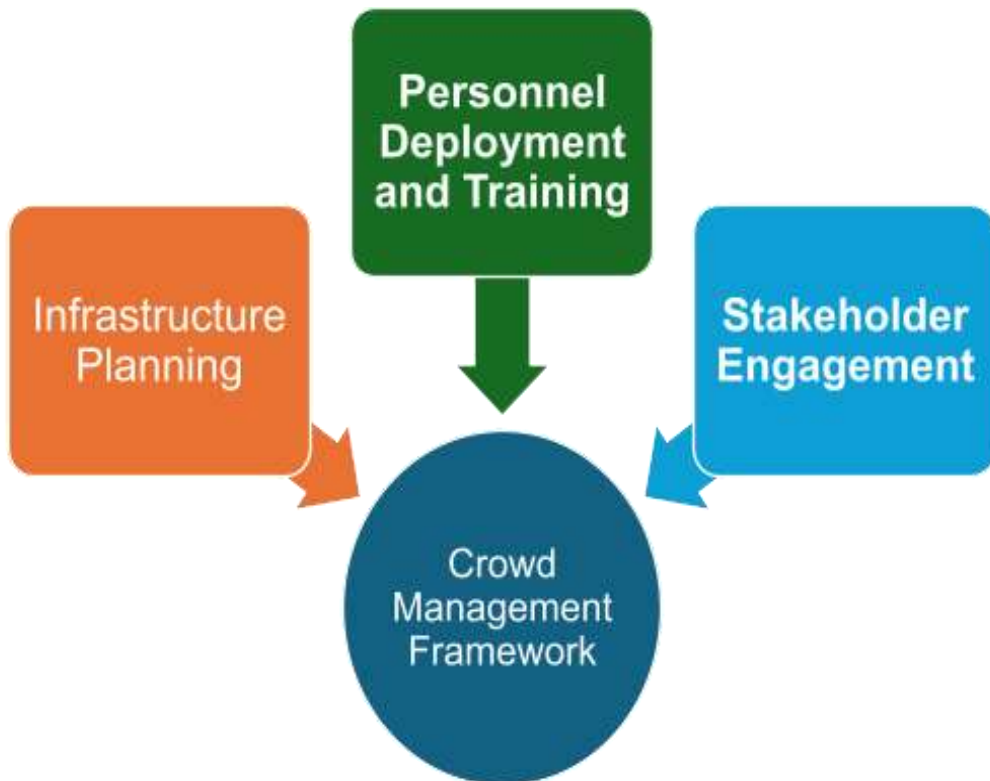
" Make yourself aware of the type of ground you are standing on, and know that in a crowd of moving people wet or uneven ground can be slippery or hazardous, causing you to fall "

Challenges	Analysis
<p>Uncontrolled Movement and Entry Surges</p>	<ul style="list-style-type: none"> • One of the primary challenges is ensuring the orderly movement of crowds, especially near entry and exit points. • Without structured pathways such as zig-zag queues and holding areas, the sense of urgency or anxiety can lead to panic-induced rushes, often resulting in injuries or fatalities. • Sudden surges can occur if the crowd perceives a delay or obstruction as a threat or barrier to achieving their goal.

<p>Fatigue and Frustration Due to Delays</p>	<ul style="list-style-type: none"> • Large crowds often have to wait long hours before reaching their destination or objective, such as a temple, concert stage, or political address. • Delays caused by terrain difficulties, poor route planning, or organizational inefficiency can lead to physical exhaustion and psychological frustration. • These emotional states increase the risk of stampedes, especially in high-density conditions.
<p>Lack of Public Awareness and Preparedness</p>	<ul style="list-style-type: none"> • Despite training efforts like fire drills and first aid courses, public awareness about crowd behavior and personal responsibility in crowded environments is limited. • Most individuals are unprepared to recognize danger signals, respond calmly to emergencies, or follow proper evacuation protocols. • This lack of knowledge can result in chaotic and unsafe behaviors when a crisis arises.
<p>Inadequate Communication and Information Flow</p>	<ul style="list-style-type: none"> • People in crowds often lack access to real-time information, which fuels anxiety and misinformation. • Without clear signage, route maps, or audiovisual aids (e.g., announcements, screens, or bhajans in a religious context), attendees may feel disoriented. • This confusion can escalate into disorderly behavior, especially during emergencies or delays.
<p>Insufficient Training and Coordination Among</p>	<ul style="list-style-type: none"> • Event organizers, volunteers, and law enforcement personnel may lack proper training in crowd psychology, emergency response, and coordination protocols.

<p>Organizers</p>	<ul style="list-style-type: none"> • Poorly trained staff can act reactively rather than proactively, worsening an already tense situation. • The lack of a unified chain of command and real-time monitoring using tools like CCTV can also hinder quick response.
<p>Media Influence and Safety Culture</p>	<ul style="list-style-type: none"> • While the media has the potential to educate the public on safety norms and responsible behavior, it often overlooks the importance of promoting crowd safety as a public concern. • Moreover, current social behaviors like the use of fireworks or overcrowding at celebrity spots are sometimes glamorized, rather than discouraged.

17. Enlist major aspects of a crowd management plan?



Aspects	Description
<p>Regulation of Entry and Exit</p>	<ul style="list-style-type: none"> • During major events, having separate entry and exit points helps manage crowds effectively. Entry should be regulated through a base area to control the flow. • The design of exits must consider the direction of movement, door swing, passage width, and exit capacity. • Seaton (1979) found that people naturally use doors in the direction they are moving, regardless of labels. • Multiple routes should be encouraged (normal, express, emergency) with varying route gradients. • This will also help in the movement of special vulnerable groups (children, people with special needs etc.)
<p>Know Your Visitors and Stakeholders</p>	<ul style="list-style-type: none"> • Effective event or venue planning begins with understanding the type of visitors, which depends on the event type, season, and venue characteristics. • Organizers should anticipate the crowd profile (age, gender, region, special needs) and understand their motives (religious, political, entertainment, etc.), including potential unwanted elements (thieves, disruptors, etc.). • It's also important to identify key stakeholders, understand their goals, and make proper arrangements for the media, including timely updates.


<p>Capacity Planning</p>	<ul style="list-style-type: none"> • Religious sites in India are prone to crowd disasters due to their location, large gatherings, and low awareness levels. • A long-term infrastructure plan is essential, considering factors like event popularity, weather, and terrain. • Visitors should pass through designated staging points equipped with basic facilities and visitor monitoring systems to control crowd flow. • A strong communication link between the base and staging points helps track miscreants or missing persons.
<p>Overall location Development Plan</p>	<ul style="list-style-type: none"> • A long-term infrastructure plan should consider factors like event popularity, frequency, weather, terrain, and local population. • Staging points or queue complexes must be set up where every visitor passes through, equipped with basic amenities and visitor counting systems to manage and regulate crowd flow.
<p>Understanding Crowd Behaviour</p>	<ul style="list-style-type: none"> • Crowd behaviour is often influenced by others, so a community-based approach is preferred over force. • Troublemakers should be identified and dealt with quickly and tactfully. • Poorly managed control measures can worsen situations, and extra care is needed at venue borders where mischief is more likely.

<p>Crowd Control</p>	<ul style="list-style-type: none"> • Effective crowd control requires anticipating crowd size and motives in advance. • Staff should wear high-visibility uniforms and maintain clear communication. • Entrances, exits, and emergency routes must be kept clear. • Continuous monitoring is essential, and space must be ensured for rescue personnel movement.
<p>Understanding the Demand and Supply</p>	<ul style="list-style-type: none"> • Understanding Demand <ul style="list-style-type: none"> ▪ Know historical numbers, crowd arrival patterns, and visitor types. Identify peak arrival times (season, day, festivals), understand public transport schedules, encourage advance registration, and improve base camp management. • Understanding Supply <ul style="list-style-type: none"> ▪ Calculate venue capacity (seating, prayers per hour) and holding area capacity. When demand exceeds supply, implement input control by restricting entries through mandatory registration or managing arrivals to prevent overcrowding.
<p>Communication</p>	<ul style="list-style-type: none"> • Clear and effective communication is paramount in crowd management. • Providing attendees with clear instructions, signage, and announcements regarding entry points, exits, emergency procedures, and prohibited behaviours can help minimize confusion and ensure compliance.

<p>Stakeholder Approach</p>	<ul style="list-style-type: none"> • Involve organizers, law enforcement, and community groups (NGOs, business associations, local committees) in crowd control. • Encourage community ownership of events. • Establish a Unified Command for coordinated decision-making, faster response, and better cooperation while maintaining individual accountability through a single Incident Action Plan.
<p>Technology Integration</p>	<ul style="list-style-type: none"> • Leveraging technology solutions such as crowd management apps, RFID wristbands, and ticketing platforms like Hytix that help to manage attendees and streamline event management and ticket selling processes, track attendance, and enhance overall crowd control efforts.
<p>Post-Event Evaluation</p>	<ul style="list-style-type: none"> • Conducting thorough debriefings and post-event evaluations allows organizers to identify strengths, weaknesses, and areas for improvement in crowd management strategies, facilitating continuous refinement and enhancement of future events.

18. What are the legislative provisions with respect to crowd management in India?

Provisions	Description
<p>Disaster Management Act, 2005</p>	<ul style="list-style-type: none"> • Allows restriction of traffic, requisition of resources, and enforcement of construction standards.

	<ul style="list-style-type: none"> • Penalizes obstruction, false claims, and warnings. • Ensures business accountability during disasters. 
<p>Police Act, 1861</p>	<ul style="list-style-type: none"> • Provides for extra police, special officers, and regulation of assemblies and roads.
<p>Madras City Police Act, 1888</p>	<ul style="list-style-type: none"> • Requires licensing of public places, eateries, and events. • Allows regulation of assemblies, removal of obstructions, and penalties for public nuisances. • Empowers authorities to cancel licenses for violations.
<p>Kerala Police Act, 2011</p>	<ul style="list-style-type: none"> • Grants powers for entry into private places, traffic regulation, and community policing. • Allows seizure of buildings, street closures, and creation of Special Security Zones.
<p>UP Melas Act, 1938</p>	<ul style="list-style-type: none"> • Empowers DM to impose tolls, license trades, and allocate sites in mela areas.

	<ul style="list-style-type: none"> • Allows fire safety rules, and demolition of unsafe structures.
Cinematograph Act, 1952	<ul style="list-style-type: none"> • Mandates licensing of cinema halls, with a focus on safety of attendees.
Delhi Cinematograph Rules, 1953	<ul style="list-style-type: none"> • Sets limits on spectator capacity, requires proper seating, exits, fire safety, and parking.

19. Describe Emergency Medical Services & Health issues in crowd management

- **Emergency medical service** is the **advance preparation** for the treatment of unexpected life threatening situations.
- These preparations may include the **treatment of heart attacks, strokes, drug overdose, seizures, etc.**
- Presently there are **no official requirements or standards** for first aid rooms at places of public assembly.
- The **emergency medical requirements necessary for camps and enroute regardless of size** should be based on the following:
 - **Type of gathering:** This gives a fair idea on **crowd behaviour and their expected number**.
 - **Type of event(s): Nature of the event** is an important activity to know as this would lead **the agencies to plan beforehand** with the history of the **type of crowd and past experience of its behaviour**.
 - **Type of crowd size and Location:** This would help in **planning the size of base camp, sending crowd en-route and expected medical support facility, proximity of hospitals and medical support services, public law enforcement agency, interior and exterior security at major events**.

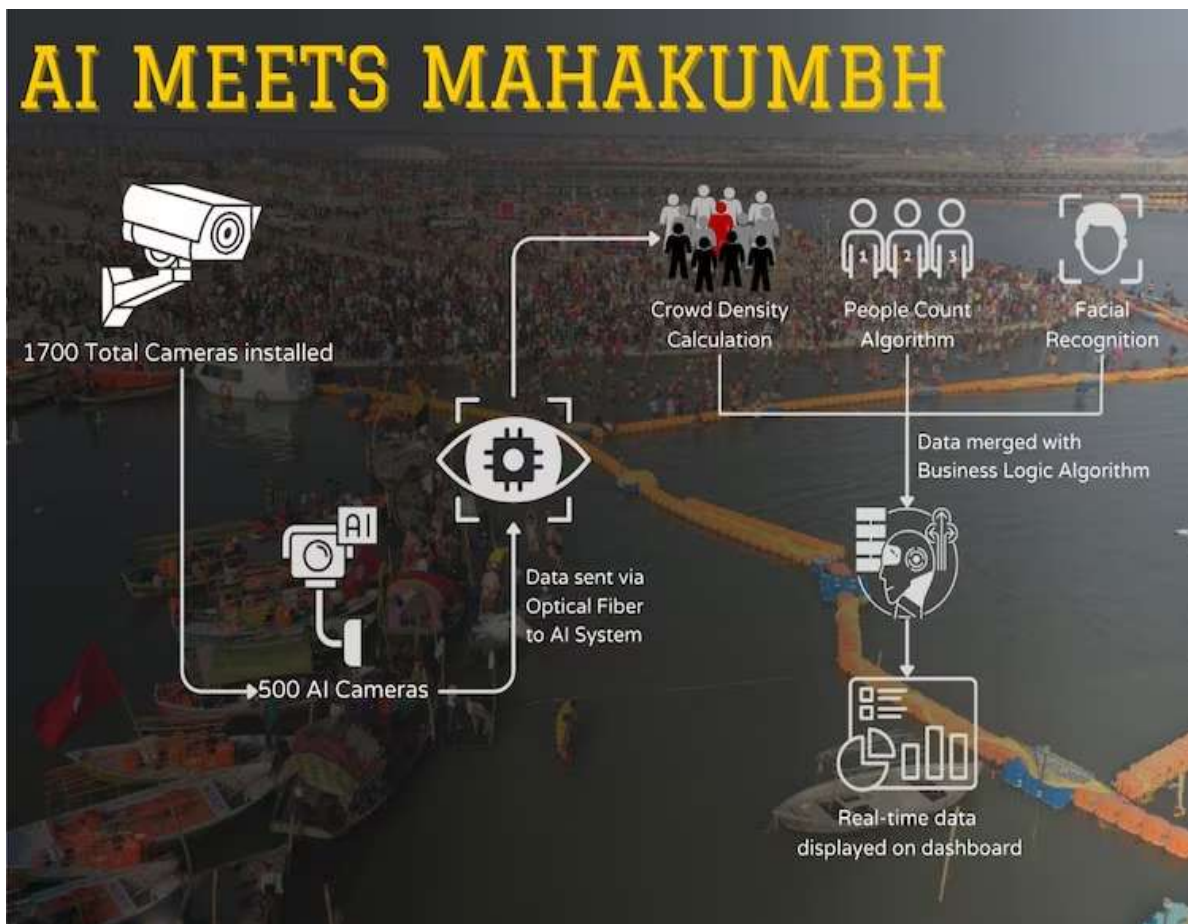
- **On-site equipment at first aid or medical facility:** While the **scope and implementation of basic standards for emergency medical service requires** special focus during any such event involving **large congregation, few of such activities are:**
 - ❖ Establishment of **direct radio and/or telephone communications** with local hospitals, law enforcement agencies, and interior and exterior security.
 - ❖ Publicizing the **location of medical rooms** so they are well known to all concerned of major events.
 - ❖ Assurance that when ambulances are on standby at a major event their **personnel are qualified to perform emergency medical care.**
 - ❖ Training of all interior security personnel in **cardio-pulmonary resuscitation (CPR).**
 - ❖ The most effective crowd management clearly delineates areas of responsibility and authority and especially underscores the need for cooperation and communication between public and private parties.

PRIMARY CARDIOPULMONARY RESUSCITATION





20. What is the role of AI in crowd management?

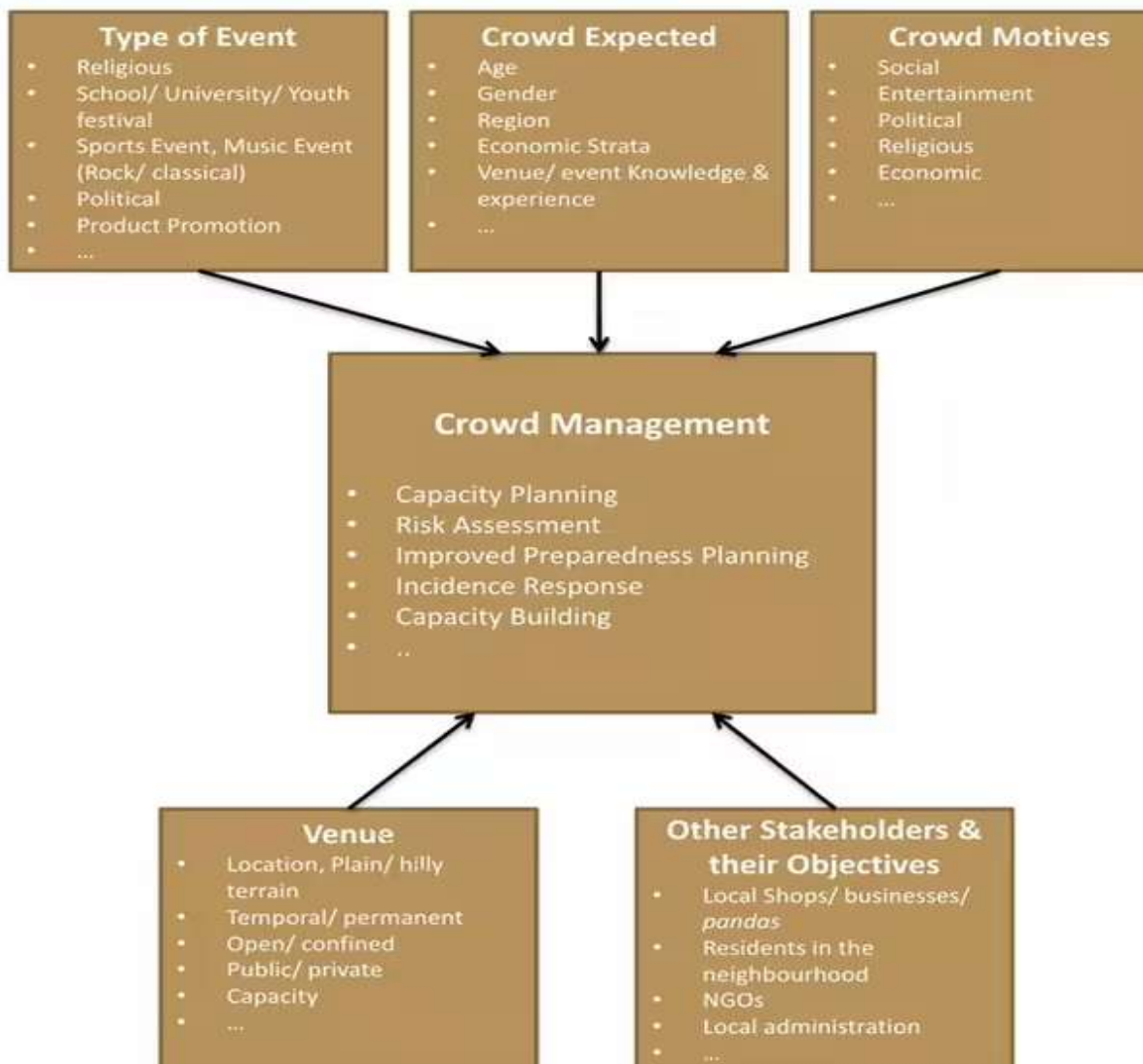


Key aspects	Analysis
<p>AI-Powered Surveillance and Monitoring</p>	<ul style="list-style-type: none"> ● Facial Recognition Technology <ul style="list-style-type: none"> ▪ Facial recognition systems powered by AI are being used to identify and track individuals within the crowd. ▪ This technology helps authorities quickly locate lost individuals, detect potential threats, and enhance overall security. ▪ AI-powered cameras scan and match faces against a database of missing persons or known criminals. ▪ The system generates real-time alerts if any suspicious activity is detected. ▪ This ensures a faster response from law enforcement agencies. ● AI-Enabled Drones <ul style="list-style-type: none"> ▪ Drones equipped with AI and high-resolution cameras are being deployed to monitor crowd density and movement patterns. ▪ AI analyzes live video feeds to identify overcrowded areas. ▪ Drones provide real-time updates to control centers, enabling quick interventions. ▪ They help in managing emergency situations by providing aerial views of congested zones.

<p>Predictive Analytics for Crowd Control</p>	<ul style="list-style-type: none"> ● Smart Traffic and Crowd Flow Management <ul style="list-style-type: none"> ▪ AI models suggest alternative routes to divert crowds and prevent bottlenecks. ▪ Automated alerts notify officials about potential overcrowding, allowing proactive crowd control measures. ▪ Smart signage systems dynamically update pilgrims about less crowded areas to ensure smooth movement. ● AI-Powered Heat Maps <ul style="list-style-type: none"> ▪ Authorities can adjust entry and exit points based on real-time crowd distribution. ▪ Resources such as food stalls, medical aid stations, and rest areas are strategically placed for optimal accessibility.
<p>AI in Emergency Response and Disaster Management</p>	<ul style="list-style-type: none"> ● Real-Time Incident Detection <ul style="list-style-type: none"> ▪ AI flags potential security threats in real-time, allowing for immediate intervention. ▪ Automated emergency alerts are sent to authorities for swift action. ● AI Chatbots and Virtual Assistants <ul style="list-style-type: none"> ▪ Lost and found assistance ▪ Route guidance and transportation ▪ Emergency contacts and medical help.

<p>AI-Powered Public Safety Measures</p>	<ul style="list-style-type: none"> ● Smart Medical Assistance <ul style="list-style-type: none"> ▪ Wearable AI sensors help track vital signs and detect potential health issues. ▪ AI algorithms identify emergency cases and notify medical teams in real-time. ▪ AI predicts potential outbreaks of infections, allowing authorities to take preventive measures.
<p>AI's Role in Communication and Public Awareness</p>	<ul style="list-style-type: none"> ● AI-Driven Social Media Monitoring <ul style="list-style-type: none"> ▪ AI identifies trending concerns and complaints from attendees. ▪ Officials can respond quickly to issues raised by the public. ● Multilingual AI Translation Services <ul style="list-style-type: none"> ▪ Provide real-time translations of announcements and emergency messages. ▪ Assist international pilgrims with navigation and information access.

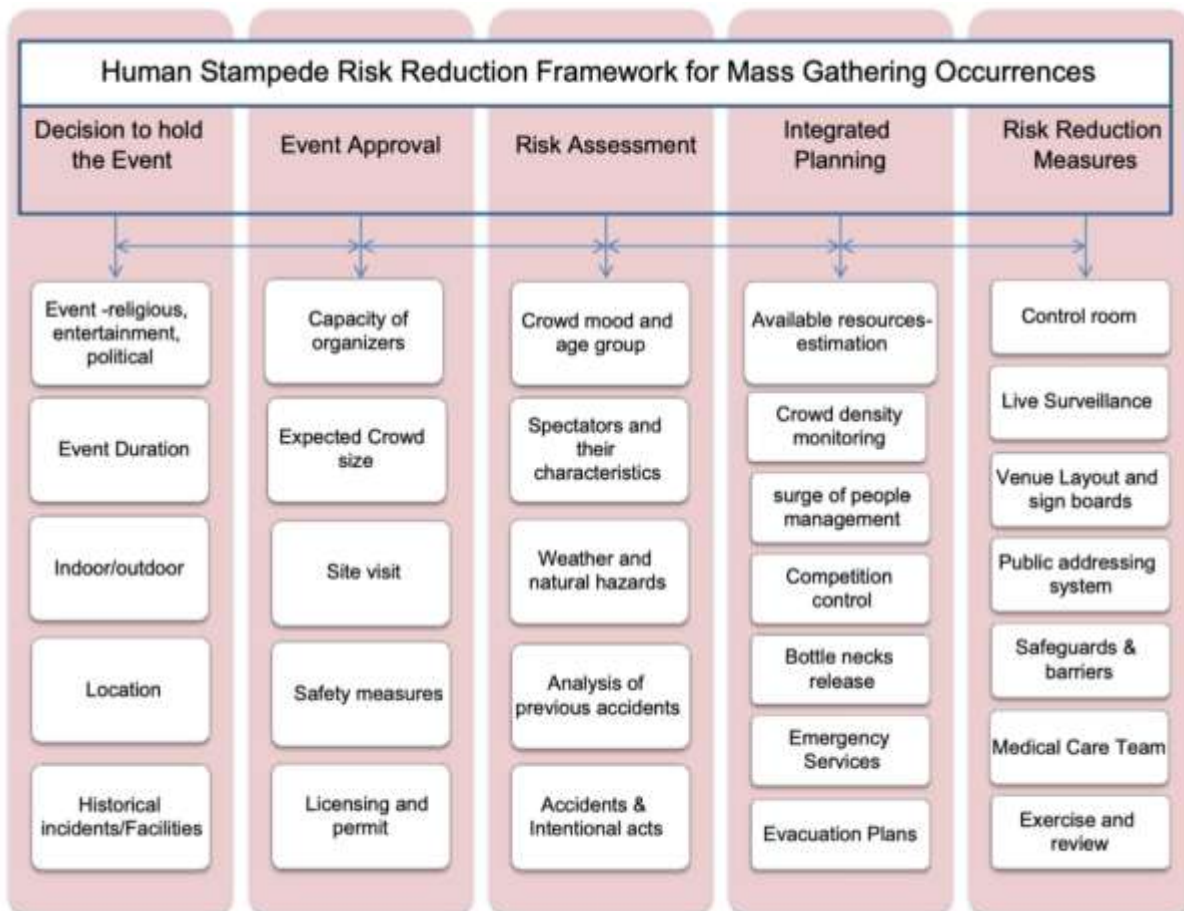
21. What are the NDMA guidelines for crowd management in India?



- The NDMA has released a comprehensive guide titled "**Managing Crowd at Events and Venues of Mass Gathering.**"
- The guide was created in **response to the recurring stampedes and crowd disasters at places** of mass gathering, including religious events, railway stations, and social or political gatherings.
- **Capacity planning:** Long-term infrastructure development based on the popularity and periodicity of events, with staging points for rest and monitoring.

- **Understanding crowd behavior:** Identifying and managing potential miscreants tactfully to prevent mass panic or chaos.
- **Risk analysis and preparedness:** Identifying potential threats, conducting risk assessments, and developing emergency plans.
- **Information management:** Efficient information dissemination to visitors, organizers, security personnel, and local residents.
- **Safety and Security Measures:** Implementing general and specific safety guidelines, deploying barriers, and ensuring emergency medical services.
- **Transportation and traffic management:** Developing emergency transportation plans and managing traffic flow effectively.

22. What should be done for effective crowd management and preventing stampedes?



Strategy	Description
<p>Stampede Risk-Reduction Framework</p>	<ul style="list-style-type: none"> • Having the right framework for planning mass gatherings is crucial, as it involves an inter-agency, multi-disciplinary approach that relies on identifying potential hazards to design and implement appropriate mitigation measures.
<p>Better Design of Spaces</p>	<ul style="list-style-type: none"> • Improving the physical organization and design of spaces is essential for effective crowd management. • Many stampedes can be prevented by enhancing the design of areas meant for mass gatherings, as well as locations where gatherings may occur spontaneously. • For instance, having sufficient exits can help in crowd movement.
<p>Live Surveillance of the Crowd</p>	<ul style="list-style-type: none"> • The live surveillance of the crowd can help organizers monitor crowd density, bottlenecks, pressure buildup, and identify the source of disturbances which can help in better crowd management.
<p>Inter-agency Communication</p>	<ul style="list-style-type: none"> • Effective communication among organizers and the crowd is essential. • It is crucial for organizers, who often represent different bodies such as temple authorities, local administration officials, and police, to communicate clearly. • Additionally, organizers must be prepared for situations that may require issuing warnings to the crowd.

	<ul style="list-style-type: none">• They need to establish who will be responsible for issuing the warning and determine how the crowd will be informed.
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23. What is the relevance of the topic for UPSC CSE?

- **For Prelims:** Hypoxia, Hypercapnia, Kumbh Mela, NDMA, Disaster Management Act, 2005, LiDAR.
- **For Mains:** Disaster Management, Strategy to address stampede.

Some previous years mains questions.

Q1. Discuss the recent measures initiated in disaster management by the Government of India departing from the earlier reactive approach. (2020)

Some questions from this year and previous years interview transcripts.

Board BB Swain sir:

- As an SP what will you do to prevent stampede/Crowd Management during religious/Important events?

Board Suman Sharma mam:

- Tell me something about Crowd management & crowd psychology.
- What do you mean by the social behaviour of a crowd?
- How will it be used in crowd management?

Board Sanjay Verma sir:

- Give a plan for security and safety of tourists in Haridwar as well as managing the crowd and not affecting the business of localities in the long term.

Board BB Swain sir:

- What principles need to be followed while managing a crowd?

Some questions for QUIZ.

Q1. Consider the following statements wrt Disaster Management in India

1. The National Disaster Management Authority(NDMA) is headed by the Prime Minister of India.
2. The National Disaster Management Authority(NDMA) is the apex executive body for disaster management in India.
3. India is not a signatory to the Sendai Framework for Disaster Risk Reduction (SFDRR)

How many of the above statements are correct?

- (a) Only One
- (b) Only Two
- (c) All Three
- (d) None

Ans: (a)

Some questions for POLL.

Q1. Do you think India lacks crowd management strategy?

- (a) YES
- (b) NO
- (c) Can't say.

Q2. Do you think administrators are solely responsible for stampedes?

- (a) YES
- (b) NO
- (c) Can't say.

