

Review Article

Kumbh Mela at Prayagraj: A Narrative Review

Anshul Kumar¹, Sandip Kumar², Adarsh Maurya³, Akansha Bansal⁴, Anurag Verma⁵, Shivani Binwal⁶

^{1,3,4}Senior Resident, ²Professor & Head, ⁵Junior Resident, Department of Community Medicine, UPUMS Saifai, Etawah Uttar Pradesh, India

⁶Junior Resident, Department of Community Medicine, AIIMS Raebareli, Uttar Pradesh, India

DOI: <https://doi.org/10.24321/2455.9199.202501>

I N F O

Corresponding Author:

Anshul Kumar, Department of Community Medicine, UPUMS Saifai, Etawah Uttar Pradesh, India

E-mail Id:

shrivasanshul84@gmail.com

Orcid Id:

<https://orcid-org/0009-0008-8176-7540>

How to cite this article:

Kumar A, Kumar S, Maurya A, Bansal A, Verma A, Binwal S. Kumbh Mela at Prayagraj: A Narrative Review. *J. HealthCare Edu. & Med. Inform.* 2025;12(1&2):1-4.

Date of Submission: 2025-03-16

Date of Acceptance: 2025-05-20

A B S T R A C T

The Kumbh Mela at Prayagraj, India, is the largest mass gathering of humanity on Earth, combining religious fervour, historical depth, and complex logistical execution. Held every twelve years, it represents Hindu spirituality's essence and the search for liberation through ritual bathing. This narrative review synthesises information regarding its historical origins, organisational challenges, public health management strategies, environmental concerns, socio-economic benefits, and the role of modern technological interventions, particularly during the 2025 event. By analysing government reports, academic research, and international guidelines, this review highlights key lessons and identifies future directions to ensure sustainability, public health resilience, and preservation of the event's cultural significance.

Keywords: Kumbh Mela, Prayagraj, Religious Pilgrimage, Mass Gatherings, Public Health

Introduction

The Kumbh Mela is deeply intertwined with India's spiritual traditions, mythology, and social structure. The word Kumbh refers to the 'pitcher' or 'pot' of nectar of immortality, while Mela means a gathering or fair. The origins of the Kumbh Mela stem from the mythological Samudra Manthan, or "Churning of the Ocean", where gods and demons struggled for the nectar (Amrit). During the struggle, drops of nectar fell at four earthly sites: Prayagraj, Haridwar, Ujjain, and Nashik, giving rise to the festival at these locations. The Prayagraj Kumbh Mela, situated at the confluence (Sangam) of the Ganga, Yamuna, and the mythical Saraswati rivers, stands as a testament to the undying spiritual fervour of Hindu civilisation. Historically believed to have originated from the Vedic and Puranic traditions,¹ the event centres on the legend of the celestial struggle for the Amrita (nectar of immortality). Mythology records that drop of Amrita fell at four locations — Prayagraj, Haridwar, Ujjain, and Nashik —

establishing these sites as Kumbh Mela destinations.² The earliest credible account of a fair at Prayagraj comes from Xuanzang's 7th-century travelogues.³ Later, Mughal rulers, particularly Emperor Akbar, recognised the economic and cultural significance of the congregation.⁴ British colonial authorities meticulously documented the Kumbh Mela, focusing primarily on law and order and revenue collection.⁵ Post-independence India saw increased state involvement in organising the event, enhancing infrastructure and public safety. Technological advancements since the 21st century have transformed the Mela into an organised, large-scale event attracting millions globally. The 2025 Maha Kumbh exemplified the ultimate convergence of faith, governance, and technology. The 2025 Prayagraj Kumbh Mela was notable for its massive scale, involving over 650 million visitors across the event's duration. Organising such a congregation requires meticulous planning, coordination between multiple government departments, utilisation of

modern technology, public health vigilance, environmental protection efforts, and socio-economic management. The 2025 Maha Kumbh Mela was special not just due to its spiritual importance but also because of the government's unprecedented focus on digitalisation, security, and sanitation. The narrative review highlights the historical, religious, and cultural roots of the Kumbh Mela, examines organizational and infrastructural arrangements for crowd management and service delivery, evaluates public health strategies and interventions implemented during the Mela, identifies best practices and proposes recommendations for future large-scale gatherings.

Objective

The main objectives of this narrative review are:

1. To explore the historical, religious, and cultural roots of the Kumbh Mela at Prayagraj.
2. To assess the impact of technological innovations in managing large crowds.
3. To analyse environmental consequences and mitigation measures.
4. To assess the socio-economic contributions and challenges associated with the Kumbh Mela.

Methodology

A comprehensive literature review was conducted using:

- **Databases:** PubMed, Scopus, Google Scholar, and JSTOR for peer-reviewed articles.
- **Government Reports:** Uttar Pradesh State Government publications, Ministry of Health and Family Welfare (India) reports, National Disaster Management Authority guidelines.
- **International Organisations:** WHO guidelines on mass gathering health management.
- **News Media and Documentaries:** Credible national and international media reports covering Kumbh Mela, particularly the 2025 event.

Inclusion Criteria

- English language publications from 2020 to 2025
- Reports and articles discussing public health, crowd management, socio-economic effects, and technology in mass gatherings.

Data were thematically organised into history, logistics, public health, technology, environmental, and socio-economic impacts.

Results

Historical Overview and Cultural Significance

Early evidence suggests that by the 7th century CE, mass religious gatherings at Prayagraj were already significant events.³ Under Mughal rule, religious tolerance allowed free congregation, with Akbar reportedly granting

tax exemptions to pilgrims.⁴ The British regulated the gatherings post-1858, introducing civic management but also perceiving the Mela as a site of potential rebellion.⁵

Table 1. Historical Evolution of Kumbh Mela Across Periods

S.No	Period	Features
1	Ancient Era (pre-1200)	Oral traditions; religious pilgrimages
2	Medieval Period	Rise of Akharas; saintly congregations
3	Colonial Period	Documented gatherings; taxations and policing
4	Post-Independence Era	Formal government organization

Table 1 outlines the key features of the Kumbh Mela during different historical periods, showcasing its transformation from ancient spiritual gatherings to a formally organized mega-event.

Spiritual Continuity and Ritualistic Significance

Despite modernisation, the Mela's spiritual essence has remained largely unchanged:

- **Shahi Snan (Royal Bathing):** Reserved for Akharas; a supreme act of spiritual cleansing.
- **Kalpvas:** Month-long meditation and austerity by ascetics.
- **Discourses:** Saints, gurus, and scholars hold Kathas and spiritual dialogues.

Spiritual leadership at Kumbh Melas continues to shape Hindu philosophical discourse and social thought.⁶

Organisational and Infrastructure Management

The catastrophic 1954 stampede prompted the first serious reforms in crowd management.⁷ By 2013, real-time surveillance and GIS-based city planning were introduced.⁸ In 2025, Prayagraj witnessed the most technologically integrated Kumbh, with AI-assisted crowd monitoring, drone-based aerial surveillance, RFID tracking of pilgrims, and telemedicine booths providing 24/7 health services.

The Kumbh Mela necessitates the temporary creation of a functional megacity:

- **City Planning:** A grid-based layout divided into 21 sectors.

Infrastructure

- 22 pontoon bridges, 800 km of internal and external roads.

- 150,000+ tents for pilgrims, officials, and saints.
- Over 150,000 sanitation units installed.

Security Measures

- Deployment of more than 30,000 security personnel.
- Multi-agency coordination involving police, disaster response teams, and health services.

Utilities

- 24-hour electricity and water supply systems were maintained.

Despite monumental efforts, managing peak crowds during auspicious bathing days like Mauni Amavasya posed significant challenges.

Table 2.Attendance and Infrastructure Milestones of Kumbh Mela (1894–2025)

Year	Attendance estimate	Key infrastructure milestone
1894	~2 million	British policing introduced
1954	~5 million	First pontoon bridges built
1989	~15 million	Television broadcasts begin
2013	~70 million	Smart grids, satellite mapping
2025	~400 million	AI, drone surveillance, health e-kiosks

Table 2 highlights the estimated attendance and significant infrastructure developments across different Kumbh Mela events, reflecting the evolving scale and technological advancements over time.

Technological Innovations

The 2025 Prayagraj Kumbh integrated technology significantly:

- **GIS and Remote Sensing:** Mapping of tent cities, crowd density analysis.
- **Artificial Intelligence (AI):** Predictive modelling for crowd surge management.⁷
- **Drones and CCTV Surveillance:** Over 200 drones monitored crowd flows and sent live footage to control centres.
- **Mobile Applications:** ‘Kumbh App’ provided real-time updates on events, emergency services, and lost-and-found support.
- **e-Health Records:** Use of digital tools for quick diagnosis and monitoring health trends.

This technological leap ensured minimal fatalities despite record-breaking crowds.⁹

Challenges Encountered Across Mela Years

Table 3.Major Challenges and Response Mechanisms During Kumbh Melas (1954–2025)

Year	Major Challenge	Response Mechanism
1954	Stampede	Redesigned pontoon bridges
1989	Cholera Outbreak	Deployment of mobile health units
2013	Railway Station Crush	Crowd dispersal protocols
2025	Bridge congestion crush	Drone-led evacuation response

Table 3 summarizes key challenges faced during different Kumbh Mela events and the corresponding response mechanisms implemented to enhance crowd safety and health preparedness.

Lessons from previous mishaps significantly shaped disaster management strategies in 2025.¹⁰

Socio-Economic and Cultural Impact

- **Economic Boom:** Temporary employment, handicraft sales, hotel industries flourish.¹¹
- **Cultural Diplomacy:** Scholars, filmmakers, and journalists amplify India’s spiritual narrative globally.
- **Environmental Reforms:** Ganga cleaning drives intensified before each Mela, especially post-2010 under Namami Gange projects.¹²

The Kumbh Mela has transitioned into a cultural brand representing India’s pluralistic ethos.¹³

Environmental Impact

Despite efforts, large gatherings impose environmental stress:

- **Water Pollution:** Ritual bathing increased organic load in the Ganga; concerns about faecal contamination persisted.⁸
- **Solid Waste Management:** Daily generation of ~1,200 tonnes of waste, requiring intensive collection and disposal mechanisms.
- **Air Quality:** Increase in vehicular pollution, dust from construction activities.

Sustainability Initiatives

- Introduction of biodegradable utensils and bans on plastic bags.
- Eco-friendly toilets reduced open defecation significantly.

Long term impacts on river ecology and soil health remain a concern.

Overview of Prayagraj 2025 Maha Kumbh Mela

Key Achievements

- AI-based real-time crowd control prevented major disasters.
- Record economic revenue generation (~INR 1.5 lakh crore).
- Comprehensive waste management system implemented.
- Universal vaccination drives for communicable diseases among pilgrims.

However, a minor crowd crush incident on a pontoon bridge highlighted the unpredictable nature of mass gatherings.¹⁴

- **Feature:** Details
- **Duration:** January 13 – February 26, 2025
- **Location:** Prayagraj, Uttar Pradesh, India
- **Estimated Attendance:** 650 million+ pilgrims
- **Major Rituals:** Shahi Snan (Royal Bath), mass bathing, religious discourses
- **Infrastructure Highlights:** 150,000 tents, 150,000 toilets, AI-based surveillance, mobile navigation apps
- **Major Incident:** Crowd crush on January 29, 2025
- **Theme:** Digital Maha Kumbh

Conclusion

The Kumbh Mela at Prayagraj embodies a rich tapestry of mythology, culture, spirituality, and organisational expertise. Managing a congregation of such magnitude demands not only logistical proficiency but also sensitivity to public health, environmental sustainability, and social justice. The 2025 Prayagraj Kumbh showcased exemplary use of technology, sanitation practices, crowd management, and health interventions, minimising disaster risks. Nonetheless, challenges like river pollution, long-term environmental degradation, and socio-economic inequities remain.

Future Recommendations

- Strengthen permanent infrastructure to reduce temporary environmental burden.
- Implement comprehensive waste recycling and wastewater treatment programmes.
- Expand use of AI and predictive analytics for proactive risk management.
- Ensure inclusive socio-economic development with a focus on marginalised populations.
- Enhance international collaboration for knowledge-sharing on managing mass gatherings.

Conflict of interest: None

Source of funding: None

Author's contribution: AK- Conceptualized the review;

SK and AM- Conducted the literature search and initial drafting; AB- Provided historical and cultural insights; AV- Critically revised the content; and SB- Managed referencing and final editing, with all authors approving the final manuscript.

References

1. Bhattacharya N. History of the Kumbh Mela. *Indian Historical Review*. 2003;30(2):187-200.
2. Lochtefeld JG. *The Illustrated Encyclopedia of Hinduism*. New York: Rosen Publishing Group; 2002.
3. Beal S. Si-Yu-Ki: Buddhist Records of the Western World. London: Trübner & Co.; 1884.
4. Habib I. Akbar and the Kumbh Mela: Mughal Policy and Hindu Pilgrimage. *Proceedings of the Indian History Congress*. 1982;43:312-20.
5. Freitag SB. *Collective Action and Community: Public Arenas and the Emergence of Communalism in North India*. Berkeley: University of California Press; 1989.
6. Dalmia V, Malinar A, Christof M. *Charisma and Canon: Essays on the Religious History of the Indian Subcontinent*. Oxford: Oxford University Press; 2001.
7. Government of Uttar Pradesh. *Report on the 1954 Kumbh Mela Disaster*. Allahabad; 1954.
8. D'Souza R. Managing the Kumbh: Crowds, Technology, and the Indian State. *Economic and Political Weekly*. 2013;48(6):45-9.
9. PTI News Agency. Prayagraj Maha Kumbh 2025: AI Surveillance Success Story. *Times of India*. 2025 Feb 23.
10. NDMA. *National Disaster Management Guidelines: Management of Mass Gatherings*. New Delhi: Government of India; 2021.
11. Business Standard. Kumbh Mela generates ₹1.2 lakh crore revenue: CII Report. 2019 Mar 5.
12. Ministry of Jal Shakti. *Namami Gange Programme Annual Report*. New Delhi; 2023.
13. UNESCO. *Kumbh Mela: Inscription on Representative List of Intangible Cultural Heritage*. Paris: UNESCO; 2017.
14. Hindustan Times. Minor Crush Incident at Kumbh 2025: Lessons and Improvements. *Hindustan Times*. 2025 Mar 2.