Pandemic Preparedness in India:
Roundtable Dialogues with Subject Matter Experts and Leaders
Crisis management and crisis communication during health emergencies

Introduction:
For this roundtable, 'biological crisis' was defined as an outbreak of high morbidity and mortality from a known or new lab-generated/natural pathogen (virus, bacteria etc) or toxin that has a risk of growing or continuing.

The discussion covered key lessons from past crises, principles and practices for managing biological crises in India, the roles of various stakeholders, the need for capacity building, and crisis communication strategies. The summary of the roundtable is presented below under two main headings: Crisis Management and Crisis Communication.

Crisis Management

Leadership in managing biological crises: Lessons, decision-making, and multisectoral coordination

Effective leadership is central to managing biological crises, as seen in past outbreaks like dengue, Nipah, COVID-19, and natural calamities. Crisis management is not only about responding effectively but also about anticipating potential threats and taking preemptive actions. The importance of learning from past experiences cannot be overstated - leaders must analyse previous crises to identify best practices and areas for improvement. The role of administrative leadership, such as IAS officers and district collectors, has been instrumental in implementing timely interventions.

It is also important to identify the decision maker in case of a crisis. Strong leadership requires proactive decision-making and the ability to mobilise resources and stakeholders efficiently. While health-related specialists play a crucial advisory role in public health decision-making, leadership in crisis response should be balanced with broader strategic, administrative, and multisectoral considerations to ensure effective and coordinated action. It is instead best suited to public health specialists who possess the necessary training and experience in managing population-level health crises.

Multisectoral cooperation, including collaboration between government agencies, health experts, and local authorities, is crucial to ensure a coordinated timely response. Leaders must also navigate complex decision-making environments where political, scientific, and bureaucratic considerations intersect. Leaders should be able to identify and involve relevant yet diverse group of stakeholders including:

- Home and health ministry to ensure policy alignment, resource allocation, and inter-ministerial coordination
- Directors of public health at central, state, and district levels as they play a crucial role in localised implementation, ensuring on-ground coordination and rapid response
- Technical teams (e.g., ICMR, NCDC) as they offer evidence-based guidelines and research support
- Infectious disease experts, virologists, and researchers who can provide scientific insights into disease understanding and containment strategies
- Aviation and military as they assist in logistics, transportation, and enforcement of containment measures
- International health authorities (e.g., WHO) for they provide global best practices and resources

Centralised decision-making often causes delays in crisis response. Decentralising power would allow local authorities, such as district collectors, to act swiftly without waiting for approvals from higher levels, ensuring a more efficient and timely response during public health emergencies. This approach was effectively demonstrated during the Nipah outbreak in Kerala, where a predefined vertical structure, from the Health Secretary to ground-level workers, ensured clear roles and responsibilities while not bypassing the chain of command, which ensures clarity in leadership.

Every leader at every level should be paired with a corresponding technical expert who can provide guidance on when to seek expert counsel, whom to consult, and how to interpret and apply scientific recommendations during a biological crisis. There is often a cultural tendency to seek reassurance by focusing on favorable information or answers that align with existing beliefs. However, leaders must develop the ability to embrace uncertainty, particularly in biological crises involving new pathogens or toxins, where evolving evidence and shifting circumstances require adaptability and informed decision-making.

Moreover, leaders should be trained to communicate risks effectively to the public, ensuring trust and compliance with public health measures. Training programs for leadership in public health and crisis management must be strengthened to ensure preparedness at all levels. The orientation and training of IAS officers can improve leadership in crisis situations, while doctors and public health professionals should be equipped with strong leadership skills to navigate emergencies effectively.

Strategies for effective crisis management: Before, during and after a biological crisis

Crisis management strategies can be categorised into three phases: proactive measures taken during peacetime to build preparedness, response strategies implemented during the crisis to mitigate its impact, and post-crisis actions aimed at recovery and long-term resilience building.

Proactive Measures

Robust disease surveillance programs serve as the backbone for early detection and response to outbreaks. Regular mock drills, simulation exercises, and early warning systems, as implemented by NDMA and state governments enhance preparedness. The National One Health Mission has fostered interdepartmental collaboration, integrating scientific expertise from 13 government departments. Strengthening coordination between central, state, and district health agencies ensures a unified and efficient crisis response.

A key lesson from past crises is the importance of integrating real-time data analytics into decision-making, allowing authorities to identify trends and intervene before outbreaks escalate. Data-sharing mechanisms, although challenging, are being refined to enhance real-time decision-making. Investments in technology-driven surveillance, such as digital health platforms, antimicrobial resistance tracking, and genomic mapping, are essential for outbreak detection and response. Investing in vaccine and therapeutic platforms with plug-and-play capabilities can enhance rapid response to future health crises. During the COVID-19 pandemic, India rapidly scaled up vaccine production and distribution, demonstrating the importance of an agile and responsive health system. However, preparedness should go beyond vaccination efforts to include strengthening hospital infrastructure, bolstering supply chain resilience, and expanding diagnostic capacities. Ensuring a stable supply and manufacturing capacity for essential medical equipment like PPE, sanitisers, and ventilators is crucial. A well-organised procurement system must be in place to guarantee uninterrupted access during emergencies.

Adopting a science-to-policy approach enhances decision-making and ensures evidence-based crisis management. While regulatory frameworks such as the Disaster Management Act and the Epidemic Diseases Act have provided structured mechanisms for crisis response, the Epidemic Diseases Act of 1897 is outdated and requires revision. There is a growing need for a comprehensive Public Health Act, rather than a Public Health Emergency Act, as the latter would only be invoked during emergencies. The Public Health Act should be multisectoral and applicable at all times, integrating health, supply chain, and essential services into a cohesive framework. During COVID-19, India heavily relied on the Disaster

Management Act, which primarily addresses natural calamities and is not specifically designed for biological crises. Given the evolving nature of biological threats like synthetic biological hazards, it is imperative to establish a new Public Health Act that is adaptive, proactive, and aligned with contemporary public health challenges. This will ensure that necessary actions can be taken without delays, facilitating a coordinated response.

A national-level coordinating body for health emergencies can further enhance preparedness and response efforts. Early threat identification enables timely investments in diagnostics, protective equipment, and vaccine development. A system should be prepared for around 9 to 10 high-priority pathogens with standard operating procedures (SOPs), protocols, industry-supplied consumables, and necessary medical countermeasures. Clear criteria for incubation periods, patient admissions, and containment ensure a swift and systematic response when needed. The presence of a dedicated emergency response fund, as seen in several states, further strengthens the system by ensuring that financial constraints do not hinder critical interventions.

During Crisis

Balanced and decentralised decision-making should engage all four key groups: politicians, bureaucracy, technical experts, and the media. While politicising public health crises is common and best avoided, some believe that politicisation is inevitable. In such cases, the focus should be on strengthening communication strategies to effectively counter its impact.

Health crises extend beyond the health sector, affecting essential and non-health commodities, access to non-crisis disease supplies including drugs for tuberculosis, HIV etc, food supply chains, and other critical services. Effective crisis management requires a multisectoral approach, ensuring coordinated action across various industries and government agencies. Supply chain management and pre-planned procurement strategies ensure resource availability during emergencies. Clear admission policies, protocols, and equitable resource distribution are necessary to prevent unnecessary hospitalisations and ensure access to critical care. Prices of commodities should be fixed by the national committee when an emergency is declared. Diagnostic investigations should be purpose-driven, guiding further action rather than consuming resources unnecessarily. The use of technology in crisis management has demonstrated significant benefits. For instance, Karnataka's Arthamithra app enabled early tracking and tracing of populations based on their medication purchases. Leveraging such digital tools can enhance surveillance, contact tracing, and outbreak containment.

Beyond public trust, emotional and psychological support for frontline workers is also critical. Health professionals, journalists, and emergency responders often face immense pressure during crises. Many suffer from post-traumatic stress disorder (PTSD) due to prolonged exposure to distressing situations. A dedicated mental health helpline for frontline workers can provide them with the support they need, ensuring their well-being while they continue to serve the public.

Post-crisis Actions

While learnings from past experiences have been applied, there is currently no established system to systematically evaluate the implementation and effectiveness of actions taken during previous crises. There is a need for greater openness and a willingness to learn from mistakes, ensuring that insights gained are documented and shared to strengthen future preparedness and response efforts.

Strengthening crisis preparedness through capacity building

Building a dedicated public health cadre is essential for strengthening crisis response mechanisms. A decentralised but structured public health workforce, trained in epidemiology and crisis management, is necessary to handle outbreaks efficiently, as seen in Tamil Nadu and Kerala. The role of civil administration in resource mobilization, logistics, and supply chain management has been crucial, as seen in Karnataka's COVID-19 response. There is also a need for more field epidemiologists, improved hospital management systems, and structured protocols for expanding healthcare infrastructure during crises. Strengthening grassroots-level governance and ensuring coordination between the central, state, and district levels will enhance crisis preparedness.

Many countries have established structured crisis management systems, such as Australia's Biological Security Act, the U.S. National Scientific Advisory Board, and the National Center for Medical Intelligence. Adapting best practices from these models can help in strengthening India's public health governance. Many regions have reported shortages of trained personnel during crises, highlighting the need for continuous recruitment, training, and retention programs. Training should not be confined to academicians and scientists but should be implemented across all levels of the system to ensure comprehensive preparedness.

a. Administrative leadership should be oriented to the multi-sectorial nature of health, which should make them open to engaging experts for timely decision-making and technical solutions.
b. Doctors need to be trained in public health, field epidemiology (e.g., Field Epidemiological Training Programme [FETP] organised by ICMR-NIE), treatment protocols, evidence-based decision-

making in crisis management, and leadership. Public health experts who cater to population health should be empowered to take decisions.

c. Frontline healthcare workers, including community health workers, nurses, and emergency responders should be trained in basic skills as they are critical to strengthening health system resilience.

Training should be conducted periodically and include regular mock drills, simulation exercises, and real-world field testing. Drawing from military practices, SOPs should be established and rigorously tested during simulations. Beyond tabletop exercises, training should also involve practical field scenarios where real-life crisis situations are simulated, with independent observers assessing effectiveness and identifying areas for improvement.

Additionally, strengthening laboratory capacity by expanding BSL-3 and BSL-4 labs will enhance diagnostic capabilities for emerging infectious diseases. Moreover, partnerships with academic institutions, think tanks, and private-sector entities can support research and development efforts in public health preparedness.

Building and establishing trust in crisis management

A recurring theme in the discussions was the vital role of trust and the challenges arising from its absence. Effective crisis management depends on trust within and across sectors, yet a structured interaction gap exists among administrators, technicians, politicians, media, and experts. Strengthening trust requires proactive engagement with credible specialists and a commitment to transparent, science-based communication. However, trust cannot be established in the midst of a crisis; it must be cultivated and maintained during peacetime. Establishing strong professional relationships and recognising each other's expertise in advance fosters credibility and facilitates collaboration when a crisis arises. Meetings like these serve as valuable opportunities to strengthen relationships and build trust across sectors.

Building public trust is fundamental to crisis management. Civil society engagement has often been overlooked, yet it plays a significant role in ensuring compliance with public health measures. Ethical considerations in decision-making, including the fair allocation of essential resources like oxygen and vaccines, must be prioritised to maintain public confidence. Governance legitimacy is tied to transparent and credible communication. Addressing misinformation proactively is crucial, as panic-driven responses can overwhelm healthcare systems, as seen during COVID-19.

Crisis Communication

Building trust and transparency in public health communication

Trust in public health communication is built on transparency, accessibility, and consistency. To ensure transparency, public health messaging should be simple, clear, and accessible to all.

A structured conceptual model for communication should incorporate four key elements:

- Accuracy – Ensuring that all public health messages are factually correct, locally relevant, and necessary at that moment. Governments must prioritise direct and honest communication, ensuring that people understand the seriousness of a crisis without unnecessary panic.
- Proximity – Making information easily accessible, understandable, and relatable to diverse communities
- Agency – Protecting individual privacy while ensuring that healthcare providers support personal health decisions
- Intention – Clearly stating the purpose of communication to avoid manipulation or misinterpretation

Kerala's transparent communication strategy during the Nipah virus outbreak is an example of how timely updates and public engagement can strengthen trust and cooperation. People need to feel confident that the information they receive is accurate and comes from reliable sources. The COVID-19 helpline in Assam, which was repurposed from a general helpline, demonstrated how centralised information centers can help the public navigate crisis situations. Such models can be expanded to provide both health information and mental health support during emergencies.

Transparency also extends to the ethical responsibility of media in crisis reporting. If journalists are excluded from the communication process, misinformation can take root, and public perception may become skewed. Engaging the media from the outset—by treating them as partners rather than outsiders—ensures a more factual and balanced narrative.

Additionally, media organizations must be supported to maintain their role in providing accurate, evidence-based health reporting. Many journalists faced pay cuts and financial instability, affecting their ability to report accurately. The financial challenges faced by journalists during the COVID-19 pandemic highlight the need for sustainable support for responsible health journalism. Training journalists and media personnel in health crisis communication will also ensure that the public receives scientifically accurate and well-contextualised information.

Beyond public trust, emotional and psychological support for frontline workers is also critical. Health professionals, journalists, and emergency responders experience immense pressure during crises, with many developing post-traumatic stress disorder (PTSD) due to prolonged exposure to distressing situations. Establishing a dedicated mental health helpline for frontline workers can ensure their well-being, enabling them to continue serving the public effectively.

Misinformation and right information

Misinformation can severely disrupt public health efforts during a crisis, often spreading faster than verified information. To counter this, governments must establish a structured system for real-time misinformation management, ensuring that the public receives accurate and timely updates. Proactive communication strategies, such as daily briefings, fact-checking initiatives, and structured advisories, can help build trust while reducing the spread of false narratives. Governments must also implement a robust public feedback mechanism to detect and correct misinformation swiftly and allow authorities to adjust communication strategies based on evolving concerns.

A centralised information repository should be established, where the public and media can access verified, real-time updates. Another approach to thwart infodemics is to have strategies that systematically address both supply and demand factors.

Supply Side Strategies

1. Limit the supply of misinformation
    a. Implement policy advocacy and legal frameworks to regulate misinformation.
    b. Introduce platform-level measures (e.g., Meta and other social media platforms) to curb the spread of misinformation.
    c. Explore systematic censorship in extreme crisis scenarios to prevent harmful disinformation.
2. Increase the supply of reliable information
    a. Train technical experts, communicators, journalists, and even citizen journalists/social media influencers to generate and disseminate evidence-based, actionable, and accessible information.
    b. Ensure accurate public health messaging through structured training and engagement.
    c. Beyond traditional media, governments should engage social media influencers and YouTubers to disseminate fact-checked public health messages. Since digital platforms are a

primary source of information for many people, these influencers can act as trusted messengers. A key example is the Mayor of Srinagar's approach during COVID-19, where social media was effectively used to maintain direct communication with doctors and patients. Community radio stations and programs like Krishi Vidhyan Kendra played a crucial role in delivering health messages in local dialects, ensuring that rural populations had access to reliable information.

3. Increase community appetite for credible information
    a. Strengthen education policies to improve overall literacy and critical thinking skills.
    b. Invest in gender equity, better exposure, and long-term public education initiatives to build a culture of informed discourse, as seen in Kerala.
4. Improve media literacy
    a. Train the public to differentiate between credible and non-credible sources of information.
    b. Encourage critical assessment of information sources, such as verifying the credibility of individuals sharing health information.
    c. Educate the public on identifying misinformation cues, checking sources, and understanding media biases.
5. Identify true experts
    a. Define who qualifies as a subject-matter expert in different public health crises.
    b. Guide media platforms to engage relevant, qualified professionals rather than recurring figures with questionable expertise.
    c. Establish a structured, transparent process for selecting experts to communicate during health crises.

Demand Side Strategies

1. Pre-bunking and debunking strategies
    a. Use evidence-based approaches to counter misinformation before it spreads (pre-bunking) and correct it once it has circulated (debunking).
    b. Conduct systematic studies on what misinformation strategies work best in the Indian context.
    c. Implement targeted interventions to correct misinformation in real time, using linguistic and culturally relevant messaging.
2. Strengthening public engagement with media
    a. Improve media responsibility by offering media platforms better access to verified experts.

b. Move away from a closed network of frequently cited experts ("Dial-A-Pizza" model) and encourage diversity in expert selection.
c. Provide structured opportunities for the media to engage with qualified public health specialists.

These strategies aim to enhance information integrity and promote a more informed and resilient public health communication system.

Training for effective crisis communication

Strengthening crisis communication requires systematic training at all levels, ensuring that key stakeholders—from government officials to grassroots health workers—are equipped with the skills to communicate effectively during emergencies. Without a well-trained communication framework, misinformation can spread unchecked, and public cooperation may decline.

Training programs should focus on different levels of public health leadership:

- Top Management (Multisectoral Leadership) – Leaders and policymakers must be trained to communicate clearly and transparently, ensuring that their messaging aligns with public health goals. They should also understand how to engage with the media and address misinformation effectively.
- Medical Officers, District Administrators, and Public Health Directors – These professionals need crisis communication skills to coordinate responses effectively and engage with local communities. Their ability to explain public health measures in accessible, jargon-free language is crucial.
- Healthcare Providers (Doctors, Nurses, Technicians, and Field Epidemiologists) – Medical professionals play a direct role in patient communication. Training in clear, compassionate, and culturally sensitive communication can improve public trust and adherence to medical advice.
- Grassroots Health Workers (ASHAs, Self-Help Group Workers, and Community Leaders) – Those working at the community level should be trained to translate technical health information into locally relevant messages that people understand and trust. The role played by ASHAs and Self Health Group (SHG) workers during COVID-19 highlights the importance of community-based communication networks.

Incorporating structured crisis communication plans—including designated spokespeople and centralised messaging—can help maintain clarity and consistency. Training technical experts in media engagement ensures that scientific information is conveyed effectively, preventing misinterpretation by the public.

Global best practices, such as Australia's Biological Security Act and the U.S. National Center for Medical Intelligence, emphasise ongoing training to ensure that crisis communication remains timely, accurate, and transparent. India can adopt similar models by integrating media engagement workshops, crisis communication drills, and public health preparedness training into its national strategy.

Additionally, ensuring regular interactions between the government, media, civil administration, and public health experts—irrespective of crisis situations—can help improve coordination, maintain transparency, and strengthen public trust over time.

Recommendations

- Develop a Public Health Act to replace outdated laws and establish a structured, multisectoral framework for health crisis preparedness and response. This act should integrate health, supply chains, and essential services to enable timely interventions.
- Establish an ongoing Expert Committee to provide evidence-based guidance, build trust, and ensure transparent decision-making in public health emergencies. This committee should regularly engage policymakers, media, and technical experts for coordinated action.
- Enhance capacity building for administrators and health professionals through leadership training in crisis management, expert engagement, and evidence-based decision-making. Regular simulation exercises and structured training programs should be conducted across all levels.
- Create a decentralised Directorate of Public Health Services with a dedicated health cadre to strengthen surveillance, outbreak response, and grassroots-level governance. Tamil Nadu and Kerala models should be adapted nationally to improve coordination and implementation.
- Build a structured communication body and train social media personnel to enhance public health messaging and counter misinformation. Training programs should equip experts, journalists, and influencers with skills to communicate accurate, actionable health information.
- Develop a national stockpiling and procurement system to ensure the availability of essential medical supplies like PPE, vaccines, and diagnostics. Standard operating procedures should be in place for rapid procurement and equitable distribution during crises.
- Implement systematic after-crisis reviews to assess response effectiveness, identify gaps, and refine preparedness strategies. Findings should be publicly documented and used to improve future public health emergency management.

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Participants List:

Sl. No	Name	Designation	Institution
1	Anish Sinha	Senior Faculty	IIPH Gandhinagar
2	Arti Ahuja	Former Addl Secretary Health & DG	Govt of India
3	Dileep Kumar SR	Assistant Director in Health Services	District Medical Office, Alappuzha
4	Girija Vaidhyanathan	Former Chief Secretary	Govt of Tamil Nadu
5	Jacob John	Former Professor of Clinical Virology	Christian Medical College, Vellore
6	Jaya Shreedhar	Sr. Health Media Advisor	Internews
7	Manoj Murhekar	Scientist G & Director	ICMR-NIE, Chennai
8	Manoj Rajan*	Additional PCCF - Forest Department & Former Commissioner, SDMA	Govt of Karnataka
9	Michael Friedman	Response Lead and Visiting Professor,	Asia Center for Health Security, NUS
10	Mohan Kumar	Senior Technical Officer	SAFETYNET
11	Mutatkar M Ramchandra	Brigadier & National Security Council Secretariat	Govt of India
12	Pavithran Rajan	Colonel & Advisor for Management Committee	Centre for National Security Studies, Bengaluru
13	Prabhdeep Kaur	Professor & Chair, ICPH	IISc, Bengaluru
14	Pradeep Khasnobis*	Disaster management Cell	MoHFW, Govt of India
15	Prakash Veer	Colonel (Health)	HQ, Dakshin Bharat Area, Chennai
16	Preeti Sudan*	Former Union Health Secretary	MoHFW, Govt of India
17	Pushpa Narayan	Senior Assistant Editor	Times of India
18	Rajan Khobragade	Addl. Chief Secretary	Health & Family Welfare, Govt of Kerala
19	Rajiv Bahl*	Secretary, DHR & DG, ICMR	MoHFW, Govt of India
20	Ramya Kannan	Health Editor & Chief of Bureau	The Hindu
21	Sampath	Addl Director, DPH&PM	MoHFW, Govt of Tamil Nadu
22	Sarang Deo	Professor, Operations Management & Deputy Dean	Indian School of Business
23	Sashi Nair	Director & Editor	Press Institute of India
24	Soumya Swaminathan	Chairperson	MSSRF, Chennai

25	Sukriti Baveja	Major General (Medical)	HQ, Dakshin Bharat Area, Chennai
26	Swetha	Project Scientist II, National Centre for Biological Sciences	TIFR, Bengaluru
27	Vijayakumar S*	Additional Chief Secretary & Chairman and Managing Director	Tamil Nadu Urban Infrastructure Financial Services Limited

Observers/Rapporteurs:

29	Lakshmi Krishnan	Specialist Scientist, ICPH	IISc, Bengaluru
30	Rekha S	Research Associate, ICPH	IISc, Bengaluru
31	Suryesh K Namdeo	Senior Research Analyst	IISc, Bengaluru

Abbreviations:

DG	Director General
IAS	Indian Administrative Services
ICMR	Indian Council of Medical Research
NIE	National Institute of Epidemiology
ICPH	Isaac Center for Public health
IIPH	Indian Institute of Public Health
IISc	Indian Institute of Science
MoHFW	Ministry of Health and Family Welfare
NCDC	National Centre for Disease Control
NDMA	National Disaster Management Authority
PCCF	Prinicipal Chief Conservator of Forest
SDMA	State Disaster Management Authority
SOP	standard operating procedures
TIFR	Tata Institute of Fundamental Research