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Resolution to Strengthen India’s Health Preparedness Framework

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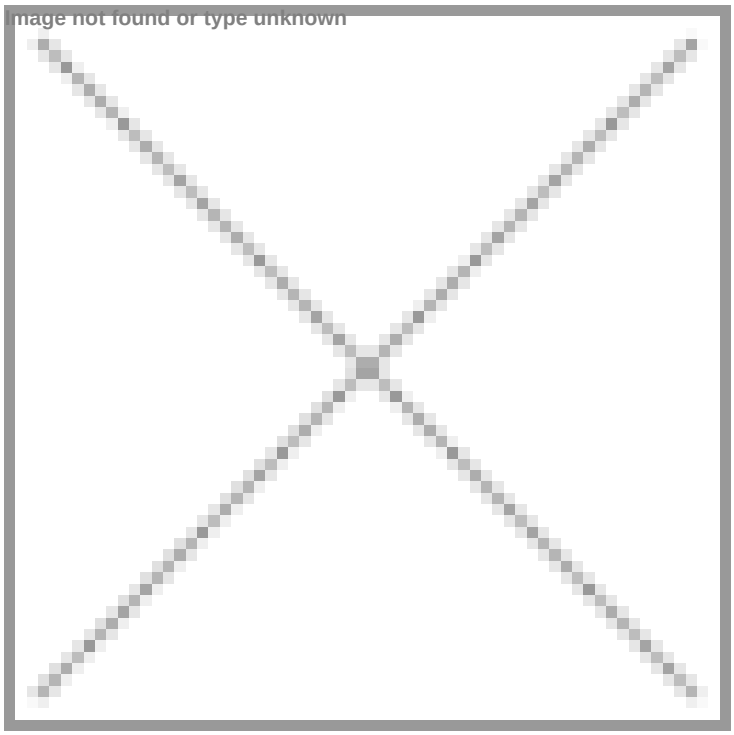
Although COVID-19 has ended, the threat of new and re-emerging zoonotic viruses remains, the most recent cases being the Nipah virus (NiV) and Guillain-Barré syndrome (GBS) outbreaks; there is also the risk of accidental or intentional biological threats. Addressing them requires effective surveillance systems and response mechanisms within a health emergency preparedness framework. Strengthening India’s ability to identify and respond to pathogens depends on technological breakthroughs in a defined framework, an innovation-based ecosystem, and sustained international collaboration.



Global public health systems were put to the ultimate test during the COVID-19 pandemic, which revealed systemic flaws in existing frameworks that enable surveillance, readiness, and responsiveness. The crisis in India exposed significant gaps in the country's institutional and legal framework for handling serious biological threats.

The Epidemic Diseases Act of 1897, a colonial-era law, and the National Disaster Management Act of 2005, which is disaster-centric, were used to manage the pandemic, but lack a thorough public health and clinical management framework. These legal tools were not created to address the complexity of a pandemic in the twenty-first century, nor were they in line with international standards for health emergency governance, despite the admirable efforts of health authorities.

India quickly saw a rise in domestic innovation, replacing its early reliance on imported diagnostics and materials. The pandemic sparked public-private partnerships (PPPs), as evidenced by the rapid development of diagnostic kits, personal protective equipment (PPE), and several domestic vaccines, including ZyCoV-D and COVAXIN. Scaling up domestic research and production was aided by government programmes like Mission COVID Suraksha and institutional leadership from organisations like the Department of Biotechnology (DBT) and the Indian Council of Medical Research (ICMR).

However, there were still issues with standardising emergency regulatory approvals, accommodating global supply chain shocks, predicting public health demands, and establishing long-lasting connections between research institutions and industry partners.

Surveillance mechanisms were rapidly strengthened, with the expansion of testing infrastructure, genomic surveillance through INSACOG, and digital tools like Aarogya Setu and COWIN. Yet, surveillance systems operated in silos, often lacking interoperability and comprehensive data integration across genomic, serological, and epidemiological dimensions. This hampered timely response and predictive modelling. In addition, data portals were not linked to the private healthcare sector, which caters to 60 per cent of the population and remains a lacuna.

Furthermore, while India has embraced the “One Health” approach in principle, its implementation remains under-resourced and fragmented. The recurrent outbreaks of zoonotic diseases such as Nipah Virus (NiV) underscore the urgency of integrated ecosystem health monitoring and preventive interventions.

The pandemic disrupted routine healthcare delivery, especially for oncology, tuberculosis, and routine clinical services. It became evident that hospitals require a more robust and flexible plan to manage surge capacity and address non-emergency-related healthcare activities. The shift from reactive, emergency-based responses to anticipatory, sustainable health governance is imperative as India strives for Viksit Bharat 2047. To guarantee comprehensive readiness against new and re-emerging biological threats, a comprehensive legal framework encompassing an integrated surveillance system, a strong PPP ecosystem, and sustained international cooperation is needed. The report makes the following recommendations to help enhance India’s health preparedness system.

Fostering Disease Preparedness through Sustained International Collaboration

India needs to institutionalise international collaborations to meet transboundary health threats. The Ministry of Health and Family Welfare (MoHFW) and the DBT need to make continued interaction through efforts such as the Quad BioExplore, US-India TRUST initiative, and the Indo-Pacific Centre for Health Security a strategic priority. Joint exercises, common data repositories, and cross-border early warning systems will enhance India's pandemic response capacity, build mutual resilience, and strengthen global health security.

Developing a National Biosecurity and Biosafety Network

India needs to implement a National Biosecurity and Biosafety Network to address accidental and intentional biological threats. This programme, developed in partnership by the MoHFW and DBT, would ensure that all laboratories dealing with pathogens follow standardised safety procedures. The network would assist capacity-building activities, knowledge exchange, and biosafety laboratory monitoring (BSL-3 and BSL-4). A Centralised risk assessment committee can provide coordination among environmental, animal, and human health surveillance.

Creating a Dedicated PPP Framework for Medical Countermeasures

A national framework for PPPs should be formalised to bridge research institutions and the private sector, especially during health emergencies. This framework should enable rapid technology transfer, emergency regulatory approvals, and standardised production protocols for vaccines, diagnostics, and therapeutics. Additionally, a dedicated funding mechanism and incentive structure must be instituted to ensure scalability and equitable access to medical countermeasures.

Operationalising One Health with Integrated Approaches

The One Health approach must move from a conceptual framework to a practical governance tool. MoHFW should lead in integrating community-driven initiatives (bottom-up) with national policies (top-down), engaging veterinarians, environmental scientists, public health experts, and social scientists.

Developing Predictive Models under an Early Warning Response System (EWS)

The DBT should champion the development of artificial intelligence (AI)- and machine learning (ML)-powered predictive models that use integrated data, from climate trends to genomic surveillance, to forecast outbreaks. These models must inform real-time resource deployment, vaccination strategies, and public communication. An early warning system (EWS) supported by such predictive models can drastically reduce morbidity and mortality through proactive measures.

Establishing an Integrated Health Data Platform

A centralised, integrated database must be developed, integrating genomic, immunological, and serological information at local, state, and national levels. This platform, coordinated by MoHFW and DBT, would enable real-time surveillance, enhance clinical decision-making, and facilitate inter-sectoral coordination. It should provide interoperability with the existing portals such as IDSP (Integrated Disease Surveillance Programme; a database under the National Health Mission) and INSACOG (the Indian SARS-CoV-2 Genomics Consortium; a joint venture between the MoHFW, DBT, the Council for Scientific and Industrial Research, and ICMR that carried out genomic surveillance), as well as integrate private sector health data to enhance comprehensiveness.

Enacting a Public Health Emergency Management Act (PHEMA)

India needs a legal foundation for coordinated responses to biological crises. A dedicated PHEMA should define the scope of emergency powers, designate responsibilities across agencies, enable rapid resource mobilisation, and decentralise implementation to state and district levels. It should also mandate inter-agency drills, periodic risk assessments, and public transparency mechanisms. NITI Aayog made similar recommendations in its expert report last year.

Climate change, anthropogenic factors, conflict, and displacement are relevant factors that enhance the risk of emerging and re-emerging infectious diseases. While the risk of accidental or deliberate biological hazards poses another avenue for biological hazards. The need to adopt a unified framework to ensure surveillance and appropriate responsiveness to health crises is the need of the hour. A resilient modelling and forecasting system with a nationalised biosecurity framework can better prepare the country for health threats.

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