

Center for Health Security

United States–India Strategic Dialogue on Biosecurity

Report from the Eighth Dialogue Session, Focused on the Second Year of
COVID-19 Responses in India and the United States and the Pandemic's
Impact on Global Biosecurity

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JOHNS HOPKINS
BLOOMBERG SCHOOL
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Center for Health Security

United States–India Strategic Dialogue on Biosecurity

Report from the Eighth Dialogue Session, Focused on the Second Year of COVID-19 Responses in India and the United States and the Pandemic’s Impact on Global Biosecurity

Co-hosted by the Regional Centre for Biotechnology of the Department of Biotechnology in the Indian Ministry of Science and Technology and the Johns Hopkins Center for Health Security

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Executive Summary

On February 8 and 9, 2022, the Johns Hopkins Center for Health Security co-hosted a virtual dialogue session with the Regional Centre for Biotechnology of the Department of Biotechnology in the Indian Ministry of Science and Technology. The meeting focused on successes, challenges, opportunities, and lessons learned in the COVID-19 responses in India and the United States, and how COVID-19 responses can continue while also preparing for future health security crises.

The dialogue focused on COVID-19 developments that occurred since the last meeting in January 2021. Discussions centered around national response efforts, mass vaccination, surveillance approaches, causes and biosecurity implications of COVID-19 misinformation and disinformation, synthetic biological risks, global biosecurity governance, and the need for future collaboration among countries and within the scientific community.

The meeting convened senior thought leaders, scientists, public health practitioners, and medical experts from the United States and India. In accordance with the dialogue format, participants offered insights based on personal expertise and did not represent the government of either country in an official capacity.

Participants from India:

- Dr. Sangeeta Agarrwal, Chief Scientific Officer, Biosafety Support Unit, Region Centre for Biotechnology, Government of India
- Dr. Anural Agrawal, Director, Council of Scientific and Industrial Research Institute of Genomics and Integrative Biology
- Deepanwita Chattopadhyay, Chairman and Chief Executive Officer, IKP Knowledge Park
- Dr. Randeep Guleria, Director, All India Institute of Medical Sciences
- Dr. Rakesh K. Mishra, Director, Tata Institute for Genetics & Society
- Dr. Shambhavi Naik, Head, Research, Takshashila Institution
- Dr. V. Siva Reddy, Former Chief Scientific Officer, Biosafety Support Unit, Regional Centre for Biotechnology, Government of India
- Ambassador Rakesh Sood, Distinguished Fellow, Observer Research Foundation
- Dr. Sudhanshu Vрати, Executive Director, Regional Centre for Biotechnology, National Capital Region Biotech Science Cluster

Participants from the United States:

- Anita Cicero, Deputy Director, Johns Hopkins Center for Health Security
- Danya Chudacoff, Associate Director of International Development, Concentric by Ginkgo
- Dr. Gerald L. Epstein, Distinguished Research Fellow, Center for the Study of Weapons of Mass Destruction, National Defense University, US Department of Defense
- Dr. David R. Franz, Principal, SBD Global; Commander Retired, US Army Medical Research Institute of Infectious Diseases
- Dr. Jaishree Garhyan, Director, Biosafety Level 3 Laboratory, Stanford University
- Dr. Gigi Gronvall, Senior Scholar, Johns Hopkins Center for Health Security
- Dr. Dan Hanfling, Vice President, Technical Staff, In-Q-Tel
- Dr. Stephen Redd, Former Deputy Director for Public Health Service and Implementation Science, US Centers for Disease Control and Prevention; Rear Admiral Retired, US Public Health Service
- Marc Trotochaud, Senior Analyst, Johns Hopkins Center for Health Security

The next dialogue meeting has not yet been scheduled, but information will be forthcoming to all participants.

COVID-19: Lessons Learned from the Second Year of Pandemic Response

India and the United States experienced large waves of COVID-19 infections, hospitalizations, and deaths during 2021, the second year of the COVID-19 pandemic. Participants from both countries stressed that the COVID-19 pandemic reaffirmed the need to make public health and biosecurity priorities at both national and global levels. Participants called for a strengthened commitment to the Biological Weapons Convention (BWC), overhauls of domestic public health systems, and increased international collaboration between India and the United States.

Healthcare Systems Challenged

India and the United States faced new challenges during the second year of the COVID-19 pandemic. The United States faced surges fueled by variants of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), forcing some hospitals to implement crisis standards of care measures that shifted medical practices to conserve resources, including extracorporeal membrane oxygenation (ECMO). In India, the rapid spread of the SARS-CoV-2 Delta variant stressed the nation's healthcare system.

The healthcare systems in both countries struggled, but some advances in healthcare delivery tools made a positive difference. For example, improved digital health capabilities for telemedicine facilitated care and the availability of point-of-care diagnostics enabled the rapid detection of COVID-19 infection, including at-home tests. Continued healthcare advancements were a welcome development in the ability to respond to the pandemic during 2021.

Mass Vaccination During a Pandemic

India and the United States began their large-scale public COVID-19 vaccination efforts in early 2021. Dialogue participants from India noted that the government announced plans to vaccinate the entire eligible population by the end of 2021. India initiated one of the world's largest vaccination programs, administering 1.7 billion vaccine doses by the date of this meeting, February 8, 2022,¹ and making significant progress toward complete vaccination coverage among adults. India also supported vaccination efforts in other countries—including Bangladesh, Bhutan, Brazil, Nepal, Maldives, Mauritius, Morocco, Myanmar, and others—by providing domestically manufactured vaccines.

India has battled both vaccine hesitancy and vaccine shortages. One participant remarked that prior to India's second wave of cases that began in March 2021, there was a lack of demand for vaccination among the public. The participant suggested that this was driven by India's success at preventing severe COVID-19 outbreaks during 2020.

The second wave became one of the largest humanitarian crises in the country. Multiple factors potentially contributed to the surge in COVID-19 cases and deaths, including the SARS-CoV-2 Delta variant, a lack of social distancing and quarantining, and a severe shortage of hospital beds and oxygen.

Limitations in manufacturing capabilities were discussed as a rate-limiting step in the vaccine development process, particularly in contrast to the rapid scientific development of candidate vaccines. A participant noted that there must always be a balance between speed and the regulatory process to ensure that vaccines are safe. It is incredibly difficult for a country to be self-sufficient in the production of vaccines.

At the time of the meeting, 70% of eligible United States residents were fully vaccinated, and a smaller proportion had received a booster dose, despite the third doses becoming largely available in December 2021. While participants from the United States were discouraged by stagnating vaccination rates, they echoed praise for the rapid development and distribution of mRNA vaccines.

Government Response

Participants discussed their assessments of governmental responses to the COVID-19 pandemic.

In India, several participants noted that the government changed the pandemic response approach from a national response to a state-based response, shifting from the approach that had dominated in the first year of the pandemic. The surge in COVID-19 infections during the second wave put immense pressure on health systems across the country, overwhelming COVID-19 care facilities and healthcare providers. One participant noted the government took quick actions to help alleviate pressure on the health system but did not elaborate on those actions. India had a series of elections in 2021, and several participants observed that candidates seeking office used COVID-19 pandemic response options as talking and leverage points.

Participants from the United States felt that the federal government never got ahead of the science, especially in communication and education around COVID-19. Some posited that politicization was unavoidable with an event of this magnitude and suggested that science-based policy decisions requiring revision with the emergence of new information could be a reason for discord between science and politics.

Participants noted that the prolonged nature of the pandemic magnified communication challenges, as the public in both countries began to experience COVID-19 message fatigue. Many US participants thought the rollout of safe and effective COVID-19 vaccines would lead to the gradual phasing out of the emergency pandemic response.

Some expressed feeling continually handicapped in reaching this goal because of new SARS-CoV-2 variants and public resistance to vaccination.

Genomic Surveillance

Participants from India shared several lessons from their efforts to increase genomic surveillance during 2021. The Delta variant and the emergence of the Omicron variant affirmed that the best time to ramp up sequencing is not at the onset of a wave of new COVID-19 cases, but in the time between waves. When case numbers are lower, new variants may be identified prior to a surge, giving decisionmakers a critical warning to quickly act to mitigate disease transmission. Participants stressed the importance of international data sharing for early detection of variants.

All participants frequently expressed the idea that pandemics are a global experience and that disease control within countries is the only path forward to end this pandemic.

Misinformation and Disinformation: Lessons Learned from COVID-19 and Implications for Biosecurity

Dr. Tara Kirk Sell, Senior Scholar at the Johns Hopkins Center for Health Security, gave a presentation on COVID-19 misinformation and disinformation. Dr. Sell discussed the nuance between misinformation and disinformation—respectively, information that does not align with current empirical evidence unintentionally and intentionally—how these phenomena manifest, and strategies at the national level to address these issues.

Dr. Sell recently co-authored an [analysis](#) estimating that vaccine-related misinformation and disinformation have caused between \$50 million and \$300 million worth of total harm every day since May 2021.² Participants discussed how misinformation and disinformation affected the second year of COVID-19 response in their respective countries and ideas for addressing these issues during the current pandemic and regarding future threats.

Diagnosing the Causes of Health-Related Misinformation During the COVID-19 Response

One major part of this discussion centered on the potential causes of health-related misinformation during the COVID-19 pandemic. Participants from India and the United States stressed that political pressures felt during the COVID-19 pandemic extended to the communication of scientific guidance. Political leaders struggled to walk back comments and guidance when new information became available, leading to perceptions that scientific evidence was being manipulated for political ends.

Others noted that inconsistent messaging across different communication platforms led people to find information and misinformation that aligned with whatever beliefs and values they already had, with that information being amplified within their social media echo chambers. Additionally, media coverage of the pandemic often faced difficulty relaying nuance in headlines. Some participants expressed that social media amplified this effect, providing ill-informed messengers a platform to quickly communicate their messages to wider audiences. The combination of these factors has led to a complicated communication environment hampered by the persistent spread of misinformation and disinformation.

Interventions to Address Misinformation

A critical step to address misinformation and disinformation is a shift in educational priorities. One participant noted that when he was in medical school, public health received little attention, and there is still a lack of commitment to teaching public health basics. Other participants noted that a lack of science and media literacy needs to be addressed to reduce the impacts of misinformation and disinformation.

In the short term, research is needed to understand how human behavior and individual attitudes changed over the course of the pandemic. Going forward, stakeholders—including government agencies, the private sector, and academia—could work together to develop a strategy for better understanding human behavior and addressing misinformation. Other aspirational suggestions from participants included discussions about how to bring more civility and decorum to public debates, but this may be difficult to achieve.

Governance of New and Emerging Biological Sciences

The third session opened with a presentation from Dr. Peter McGrath, Coordinator at the InterAcademy Partnership. The InterAcademy Partnership brings together more than 140 national, regional, and global member academies to highlight scientific solutions to global problems. Dr. McGrath was part of a team that recently developed the [Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists](#) (Tianjin Biosecurity Guidelines), a set of 10 guiding principles for ethical life science research. The drafting of the Tianjin Biosecurity Guidelines was organized by 3 institutions: The InterAcademy Partnership, Tianjin University Center for Biosafety Research and Strategy, and the Johns Hopkins Center for Health Security.³

Dr. McGrath explained how the guidelines were collaboratively written through a process that included a series of workshops with global participation from life science practitioners. Dr. McGrath then opened a discussion on the process of drafting governance language and the challenges that would come with the implementation of new governance frameworks in the future.

Formation of the Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists

Participants from India and the United States generally agreed that the Tianjin Biosecurity Guidelines could set a solid foundation for new scientific codes of conduct and supplement codes that already exist institutionally, regionally, or more broadly. Several participants asked where disputes came in the drafting process and how the drafting team settled these controversies. Dr. McGrath detailed a discussion around the use of the word “mandatory” when talking about the code of conduct, sharing how this singular piece of language evoked strong support from some, while raising many questions about its broad applicability from others.

Several participants asked if there was a noticeable change in the global political landscape that led to the formation of the guidelines. One participant noted that in India, biosecurity garnered little support prior to 2020, with those advocating for improved biosecurity struggling to obtain specific funding separately from efforts to improve biosafety.

Participants shared that the COVID-19 pandemic has led to more urgency and attention on traditional issues around biosecurity. Participants felt there now is greater appreciation for the impact that a large-scale biological event, like the COVID-19 pandemic, could have on the global population. Dr. McGrath and other members involved with the Tianjin Biosecurity Guidelines’ drafting noted there was mutual interest in forming the guidance prior to the start of the COVID-19 pandemic, but the pandemic has helped reinforce the goal of achieving some positive recognition at the BWC level.

Implementation of Biosecurity Governance

The primary questions about the Tianjin Biosecurity Guidelines centered around challenges of implementation. Many participants shared experiences working to implement past codes of conduct and expressed a need to incorporate other partners into the dissemination and implementation processes if the Tianjin Biosecurity Guidelines are to garner wide support. Dr. McGrath communicated that the team had discussed plans to pursue building a sustainable curriculum but there were no discussions in previous meetings around the development of monitoring mechanisms or implementation of penalties regarding the guidelines.

Participants shared that over the last 5 years, there have been several new guidelines implemented across India, and the government developed a biosupport unit to aid in the guidelines’ preparation. Even with these new guidelines, they stressed there remains a need for ongoing efforts to build effective monitoring systems.

Some participants noted that guideline implementation will remain challenging because of the breadth of possible threats, including vulnerabilities in the supply chain. As an example of the nuance needed with guidance and implementation, one participant shared an example of how a ban on international purchasing of ammonium nitrate was designed to prevent the potential production of explosives, but in turn limited the supply of a key lab resource.

The Convergence of Chemical and Biological Research: Biosecurity in a Rapidly Evolving Biotechnology Environment

The final session of the dialogue featured a presentation by Dr. Diane DiEuliis, Assistant Director of the Center for the Study of Weapons of Mass Destruction and a Senior Research Fellow at National Defense University. Dr. DiEuliis shared that prior to the COVID-19 pandemic, there was a shift in the global recognition of biology-driven technological capabilities. The US Department of Defense made biotechnology one of its 10 modernization strategies, the BioMADE program launched, and biological applications were beginning to be recognized.

Dr. DiEuliis described new processes that use synthetic biology to produce chemicals and laid out how this evolution has necessitated collaboration between disciplines. Dr. DiEuliis predicted those technological advances will continue as the bioeconomy grows, stressing that cross-sector collaborations will be key in maintaining global biosecurity.

Expanded Monitoring of Synthetic Biology and Gene Sequencing

Several participants raised questions about ways to manage the threat of developing potentially harmful products using biology. Scientists now have the capability to use synthetic biology to engineer common organisms, like yeast, to produce possibly harmful or illicit substances. Participants recognized that the technology has exceeded current capabilities to universally monitor new threats and raised the question of how to best address this deficiency.

Dr. DiEuliis shared that there is a large amount of work around guidance for screening and monitoring gene synthesis but noted list-based screening guidance can have gaps. She stressed that new monitoring systems need to be driven by private-public partnerships, utilizing the strengths of all entities to build more secure systems. She also asked who should hold such conversations: is it the BWC, the Organisation for Economic Co-operation and Development (OECD), or some other organization? Many of the companies that are developing products do not participate in meetings or activities associated with the BWC, so alternatives should be considered.

Pathways Forward for Biosecurity

The group stressed that there needs to be a purposeful effort to maintain momentum to address biosecurity issues, given the rapid rate of biological advancement. Several ideas were discussed on the best approach to biosecurity governance in the years to come. Some questioned now-outdated public opinion data surrounding biotechnology and highlighted the potential value of gaining renewed public insight into biological advances. They noted that the contributions biotechnology can make to health and the economy go far beyond the “GMO crops” that have generated public controversy. Others expressed concern that the BWC landscape is at a critical point and will need to take action to prevent falling into irrelevance. The last 2 years have primed states parties with firsthand experience of the dangers of biological agents and the importance of international collaboration. The group shared a common sentiment that there are many ongoing disparate activities in the wake of COVID-19 and stressed the need for international collaboration now and into the future.

India and the United States are both leading the charge into a future built on biological advancements. Dialogues that bring together thought leaders, policymakers, and scientists to share experiences and perspectives on critical issues will continue to provide immense value. These conversations enable transparent talks between parties and open the door for collaboration on tough topics with unclear answers. As India and the United States continue to respond and recover from the COVID-19 pandemic, these discussions provide valuable insights on the collective effort to create a more resilient global population, prepared for a wide array of future biological threats.

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Appendix A. About the United States–India Strategic Dialogue on Biosecurity

This meeting is an adapted and shortened version of the United States–India Strategic Dialogue on Biosecurity. Over the past 6 years, 7 meetings of this Dialogue have occurred in Washington, DC; New Delhi; Hyderabad; and virtually. The meetings are organized by the Johns Hopkins Center for Health Security, with an award from the Biological Threat Reduction Program, supported by the US Department of Defense, Defense Threat Reduction Agency.

Appendix B. Agenda

Health Security: Paths Forward for India and the US

Virtual via Zoom February 8 and 9, 2022

8:00 AM – 9:30 AM EST

6:30 PM – 8:00 PM IST

Co-Hosted by the Johns Hopkins Center for Health Security and the Regional Centre for Biotechnology of the Department of Biotechnology within the Indian Ministry of Science and Technology

AGENDA

Day 1: February 8, 2022

8:00 – 8:05 AM EST **Welcome, Introductions, Goals for the Meeting**

6:30 – 6:35 PM IST

Opening Remarks:

- Gigi Gronvall, PhD, Senior Scholar, Johns Hopkins Center for Health Security
- Sudhanshu Vrati, PhD, Executive Director, Regional Centre for Biotechnology, Department of Biotechnology, Ministry of Science & Technology, Government of India

8:05 – 8:45 AM EST **Dialogue Session I: Challenges and Lessons in the Response to**

6:35 – 7:15 PM IST **The Second Year of the COVID-19 Pandemic**

Moderator: Gigi Gronvall

Session Description:

Participants are invited to comment on the COVID-19 public health and healthcare response efforts in their respective countries during the second year of the COVID-19 response. Questions in the conversation include: what has worked and what has not in the second year of the COVID-19 pandemic? How did the rise of SARS-CoV-2 variants impact the government's response to the COVID-19 pandemic? What challenges arose with the domestic production and dissemination of COVID-19 vaccines? How did each government balance the continued risk from the COVID-19 pandemic with growing economic and social concerns? How did the country's testing strategy and implementation evolve over time? What lessons have come from the experience managing a prolonged response to a public health emergency? What challenges affected clinical practitioners and health systems? How have the lessons learned from COVID-19 help inform the continued response and recovery from the COVID-19 pandemic and pandemic preparedness plans? How are both countries preparing to modernize and scale their domestic manufacturing capabilities in the wake of COVID-19? What lessons were gleaned during vaccine diplomacy efforts?

8:45 – 9:25 AM EST **Dialogue Session II: Misinformation and Disinformation During
7:15 – 7:55 PM IST Public Health Emergencies: Challenges and Interventions**

Moderator: Anita Cicero

Session Description:

Opening Remarks: Dr. Tara Kirk Sell, Senior Scholar, Johns Hopkins Center for Health Security

The COVID-19 pandemic has shone a spotlight on the rising impact that misinformation and disinformation can have on the response to a public health emergency. Dr. Tara Kirk Sell will open this session with a discussion of the root causes of misinformation and disinformation, their impact during health emergencies, and potential avenues to address this issue moving forward. Participants will then discuss their reflections on potential solutions for health-related misinformation and disinformation. Questions may include: how has misinformation and disinformation impacted your operations during the response to the COVID-19 pandemic? Have you employed successful strategies to mitigate the spread and impact of misinformation and disinformation? How has misinformation and disinformation evolved over the course of the pandemic? What long-term challenges do you foresee surrounding misinformation and disinformation in a post-pandemic environment? Do you see potential for misinformation and disinformation to impact your work on biosecurity in the aftermath of the COVID-19 pandemic?

9:25 – 9:30 AM EST **Day 1 Closing Remarks**
7:55 – 8:00 PM IST

Day 2: February 9, 2022

8:00 – 8:05 AM EST **Opening Remarks**
6:30 – 6:35 PM IST

Dr. Gigi Gronvall, Senior Scholar, Johns Hopkins Center for Health Security

8:05 – 8:45 AM EST **Dialogue Session III: Effective Governance of Advanced Life
6:35 – 7:15 PM IST Science Research and Technology Development**

Moderator: Anita Cicero

Session Description:

Opening remarks: Dr. Peter McGrath, Coordinator, The InterAcademy Partnership

This session will explore tools and measures for effective governance of advanced life science research and technology development. Dr. Peter McGrath, Coordinator at The InterAcademy Partnership, will provide opening remarks on his work with the organization to establish

biosecurity norms among practitioners working in the life sciences. The conversation will include a brief overview of the construction and dissemination of the Tianjin Biosecurity Guidelines for Codes of Conduct for Scientists, a series of ethical guidelines and standards developed this past summer. This conversation will also include updates on international efforts to strengthen standards and governance mechanisms related to biological security and safety and dual use research of concern. Questions for participants to discuss include: what are the core guiding principles that should act as a foundation for biosecurity governance? How has the COVID-19 pandemic changed the global biosecurity landscape? What do you view are the current gaps in the global biosecurity landscape? What actions could be taken to strengthen global biosecurity? What is the role of international organizations such as the World Health Organization in developing governance strategies?

8:45 – 9:25 AM EST **Dialogue Session IV: The Evolving Nature of Advanced Life Science**

7:15 – 7:55 PM IST **Research: The Promise & Governance of New Biological Technologies**

Moderator: Gigi Gronvall

Session Description:

Opening Remarks: Dr. Diane DiEuliis, Assistant Director and Senior Fellow, Center for the Study of Weapons of Mass Destruction, National Defense University, Washington, DC

This session will look toward the future, with an exploration of the promise of new biotechnologies, as well as new challenges for biosecurity governance. Dr. Diane DiEuliis of National Defense University will discuss the overlap of biological and chemical governance challenges that were explored in the 2018 US National Academies report, “Biodefense in an Age of Synthetic Biology”; US government efforts to spur biomanufacturing with its manufacturing institute BioMADE; and the ethical, legal, and societal issues that arise from modern biotechnology development. Questions for participants to discuss include: what are the most pressing issues in biosecurity governance for the immediate future? What technological advances in the life sciences and in converging fields do we anticipate in the coming decades (e.g., Artificial Intelligence, Chemistry, Nanotechnology, Neuroscience)? How can governance approaches keep up to date with technological advances in the life sciences? What steps can the scientific community take to strengthen global biosecurity at the rate of advancements in the biological sciences? How can life scientists learn from and work with colleagues in other disciplines to inform and strengthen biosecurity governance? What are the most important steps to take that facilitate benefits from new advancements in biological science while minimizing novel risks?

9:25 – 9:30AM EST **Next Steps for Future Dialogues and Meeting Adjournment**
7:55 – 8:00PM IST

Appendix C. Participants

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