White Paper: The Joint Assessment Mechanism

Discerning the Source of High-Consequence Biological Events of Unknown Origin

By NTI Global Biological Policy and Programs (NTI | bio)

Background and Nature of the Challenge

The COVID-19 pandemic has caused tremendous loss of life, severely damaged economies, exacerbated political instability, and generated a variety of second-order consequences that continue to disrupt global systems.

The pandemic has revealed that national governments and the international community are woefully unprepared to respond to pandemics—underscoring our shared vulnerability to catastrophic biological risks. Without stronger international biosecurity and pandemic preparedness, the world will remain unprepared for future biological events, which could cause damage as severe as COVID-19 or possibly much worse.

It is crucial that leaders take a longer-term view and work to develop and implement steps to protect against future biological risks. Such efforts must be driven by the recognition that the next global catastrophe could result from a naturally emerging infectious disease outbreak, a laboratory accident, or the deliberate misuse of bioscience and biotechnology.

Biological risks are growing over time. The world has witnessed how global travel, trade, urbanization, and environmental degradation can fuel the emergence and spread of infectious disease threats. However, the serious risks embedded in the very bioscience research and technology advances that offer vital innovations for human health remain less understood and addressed—even though they present opportunities for accidental release or deliberate abuse of biological agents that could cause as much or more harm than COVID-19.

Considering these growing risks, the ability to rapidly discern the source of emerging pandemics is critically important. Done correctly, such an assessment can provide information to inform the public health response and curtail the pathogen's spread. In the event of a deliberate outbreak or accident, it can help us understand what happened so we can close dangerous biosecurity and biosafety gaps. Having a credible capability to discern pandemic origins is also essential for preventing future human-caused high-consequence biological events by signaling to malicious actors that they are likely to get caught if they attempt to carry out a bioweapons attack.

A Gap in International Capabilities to Discern Pandemic Origins

The ongoing challenges of discerning COVID-19 origins have highlighted the need for bolstering this capability internationally. Determining the origins of a disease outbreak in a forum that is scientifically based, internationally trusted, and as insulated as possible from geopolitics will increase confidence in the eventual finding.

As part of these efforts, it will be important to strengthen the capabilities of the United Nations' system to investigate pandemic origins. This includes strengthening and investing significantly more resources in existing capabilities, including the United Nations Secretary-General's Mechanism (UNSGM), which has the authority to investigate allegations of deliberate bioweapons use.

In addition, the international community must also fill capacity gaps. There is a gap in international capabilities to investigate the source of biological events of unknown origin, which falls at the "seam" between existing mechanisms—including the outbreak investigation capabilities of the World Health Organization (WHO) and the UNSGM.

Role of the World Health Organization

The WHO is well-positioned to assess outbreaks of natural origin—often referred to as "spillover events" from animals to humans—and it has both a comparative advantage and clear support from its member states in these situations. However, WHO is still deciding how far it wants to go in assessing an outbreak's origins once signs begin to emerge that the outbreak may have resulted from a lab accident or a deliberate bioweapons attack. WHO needs to maintain trust and openness with its member states to carry out its public health mission, and engaging in security-related issues could make this much more difficult.

WHO has engaged in efforts to strengthen its capabilities to respond to outbreaks of ambiguous origin, including by establishing the Scientific Advisory Group for the Origins of Novel Pathogens (SAGO).[1] While this is a valuable and important effort, the SAGO performs an advisory function, and it does not have a standing capacity or operational components. Therefore, in our view, the SAGO does not fill the capability gap outlined in this paper.

Role of the UN Secretary-General's Mechanism

On the other end of the spectrum, the United Nations Secretary-General's Mechanism was established by the UN General Assembly and endorsed by the Security Council to give the Secretary-General the authority to investigate allegation of deliberate bioweapons use. While it is the Secretary-General's decision alone—and not subject to approval by the Security Council—the UNSGM's mandate does have some notable constraints.

The UNSGM has a three-part test that must be met before it can be activated. It can only investigate (1) formal allegations of (2) biological weapons use when (3) states bring them forward. This has never happened, likely due to the high *de facto* political bar for making a serious allegation, including the fact that it requires a lot of hard-to-collect evidence.

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[1] World Health Organization, "Scientific Advisory Group for the Origins of Novel Pathogens," n.d., https://www.who.int/groups/scientific-advisory-group-on-the-origins-of-novel-pathogens-(sago) (accessed June 25, 2022).

A Gap Remains

A critical gap remains within the authorities and capabilities of existing mechanisms across the UN system. The recent COVID pandemic illustrates some of this gap. Although uncertainty persists as to whether SARS-CoV-2, the virus responsible for COVID-19, emerged naturally or was accidentally released from a laboratory, WHO has experienced difficulties investigating the source of the pandemic. This difficulty is due to technical constraints coupled with the political reality of the organization's need to maintain trust and support among all its member states. It was also not appropriate to deploy the UNSGM in this case because its mandate is limited to investigating allegations of deliberate attacks with biological or chemical weapons.

The Biological Weapons Convention (BWC) includes procedures for convening consultative meetings of states-parties or for lodging allegations about the development, possession, or use of biological weapons with the UN Security Council.[2] The Security Council could take up such complaints for investigation, yet in the nearly five decades years since the BWC came into force, no complaint has been made.[3] Such constraint and inaction call into question the utility of and trust in existing procedures.

There is a better way to jointly connect the capabilities of WHO and UNSGM, and to provide capabilities that they do not currently have.

Proposed Solution:

Establishing the Joint Assessment Mechanism (JAM)

Institutional Considerations for the JAM

To address this gap, NTI is working with international partners to explore the possibility of establishing a new "Joint Assessment Mechanism" (JAM) to discern the source of high-consequence biological events of unknown origin. This mechanism would address cases where there is ambiguity about the source of a biological event—specifically, whether it emerged naturally or was deliberately or accidentally released from an academic, commercial, or government laboratory.

The JAM would be most effective if it were based in the Office of the U.N. Secretary-General. This institutional home would provide the authority and flexibility to activate and deactivate the mechanism, as needed. This also would enable the JAM to serve as an honest broker, trusted by member states to conduct unbiased assessments, and it would allow the Secretary-General to draw upon existing capabilities, including from the UNSGM and the WHO.

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[2] UNODA, "Biological Weapons Convention," n.d., https://www.un.org/disarmament/biological-weapons/ (accessed June 25, 2022).
[3] Jonathan B. Tucker, "The 'Yellow Rain' Controversy: Lessons for Arms Control Compliance," *The Nonproliferation Review*, Spring 2001, pp. 25–42, https://www.nonproliferation.org/wp-content/uploads/npr/81tucker.pdf.

The JAM would be a standing entity in the Secretary-General's office with an internationally diverse roster of scientific experts responsible for conducting ongoing data analysis; this would provide an ongoing baseline awareness of current biological risks. The JAM would also be ready to rapidly launch an assessment of a biological event when activated. To support its analytical work, the JAM would use modern tools and technologies, including bioinformatics, data science, and artificial intelligence.

The JAM would formalize and strengthen the interaction of the UNSGM and the WHO. The JAM is designed to support better interconnectivity between UN and WHO capabilities, and it would be part of an integrated, mutually supportive system for assessing pandemic origins. The JAM does not need to be an entirely new organization within the UN; rather, the JAM would provide an interface to help the UN system better assess a disease outbreak of unknown origins.

The JAM would provide support and valuable information to the Secretary-General and member states by providing baseline information about the biological risk landscape on an ongoing basis during "peacetime"—i.e., when a public health emergency is not occurring.

During "peacetime," the JAM could help combine public health information with security-related information and developments, along with data on locations where research is being carried out on pathogens with pandemic potential. In this non-activated phase, the JAM could assist in alerting the Secretary-General about serious outbreaks that could affect UN operations or require UN action. The JAM would not duplicate functions that WHO may carry out in this regard; instead, the JAM could receive data from WHO and integrate it into ongoing risk assessment information that goes to the Secretary-General.

Origins of the JAM Concept

NTI originally recommended establishing a new Joint Assessment Mechanism in its 2020 report, "Preventing Global Catastrophic Biological Risks," which was based on lessons learned from a senior-level tabletop exercise hosted in partnership with the Munich Security Conference during the very early stages of the COVID-19 pandemic in February 2020. The exercise featured a fictional scenario that highlighted how determining whether the outbreak in question was due to poor laboratory biosafety practices or malicious intent proved critical to the effectiveness and speed of the international response. The idea of the Joint Assessment Mechanism emerged as a means of providing this capability, and since then, the concept has been further refined in ongoing consultation with international experts and stakeholders.

In July 2021, NTI | bio convened a diverse international group of experts to explore the prospect of a Joint Assessment Mechanism. The discussions revealed significant international interest in strengthening the capabilities of the UN system to rapidly assess the origins of high-consequence biological events, as well as support for NTI's proposals that address this need. NTI has continued to advance this initiative by convening two international expert working groups several times to develop increased specificity for the technical and operational requirements for the JAM as well as key policy and institutional considerations.

Mandate and Authority

NTI and international partners propose the following mandate for the JAM: "Establish the facts regarding the origins of an unusual outbreak." Basic questions that the JAM could address include: "Who and what is affected? What, where, and how did the event happen?"

To build a JAM with international credibility, a broad coalition of nations will need to support this initiative. While geopolitical tensions are currently high, and multilateral forums have experienced significant strains, the global community needs to continue to pursue opportunities to strengthen global health security and the international community's collective ability to rapidly discern pandemic origins. There are two methods for establishing the JAM within the UN:

(1) The UN Secretary-General could establish the JAM under their own authority and within the Office of the Secretary-General. This course of action would require broad member state support but would not require formal action in the General Assembly.
(2) The authority to establish this new mechanism could be established through a UN General Assembly vote.

Option (1) seems more feasible in the current geopolitical environment, and it maintains the flexibility to adapt the structure over time, which can help "future-proof" the mechanism.

NTI and our partners have socialized and solicited feedback on the JAM through a series of publications and events. These efforts have included: a panel discussion hosted by the Vienna Center for Disarmament and Non-Proliferation, a roundtable discussion hosted by the European Union at the Palais des Nations in Geneva; a side-event at the 2022 NPT Review Conference in August 2022; a presentation at the Global Partnership Working Group October 2022 meeting in Berlin; engagement at the December 2022 Ninth BWC Review Conference in Geneva; and a November 2023 roundtable discussion in New York hosted by the Austrian Ambassador to the UN and including ambassadors, high-level diplomats, and experts. Publications on the JAM include pieces in the European Leadership Network, Asia Pacific Leadership Network, *The Hill* newspaper, Arms Control Today, and the Argentine Council on Foreign Relations (Spanish, English). Going forward, NTI will focus on holding meetings with UN member states to socialize, gather feedback, and build support for the JAM.

The JAM policy proposal is also related to ongoing UN discussions. For example, UN Secretary-General Guterres, in his 2021 report "Our Common Agenda," made concrete proposals to strengthen global health security and preparedness. He also called for convening an emergency platform to respond to complex global crises. In his 2023 follow-up policy brief "Strengthening the International Response to Complex Global Shocks—An Emergency Platform," Guterres described how the proposed emergency platform would not be a standing UN body but rather a set of protocols that support existing UN entities when activated. While the emergency platform would include biological risks in its scope, it would not focus on them. Since it would not "bypass" the UN Security Council and UN General Assembly, the platform may be subject to political constraints that the JAM is not.

A key open question is how to move forward with a more comprehensive strategy for building UN member state support and a broader coalition to advance the JAM.

Proposed Operation of the JAM

As previously argued, housing the JAM within the Office of the Secretary-General would best provide the mechanism with the needed authority, flexibility, and visibility to activate and deescalate as necessary. This would also allow the Secretary-General to use existing capacities built up under the UNSGM as well as call on the WHO to assist with its expertise and

capabilities. To facilitate a strong connection to the WHO, the JAM would include a liaison officer from WHO as part of its staff.

In most cases, an early outbreak assessment would begin with WHO conducting a public health investigation. For outbreaks that are clearly of natural origin, WHO should be able to complete an assessment on its own. For high-consequence biological events where the origins are unclear, the Secretary-General can task the JAM with conducting an assessment. The JAM can help WHO avoid political negotiations and consequences that could interfere with its primary goal of addressing and protecting public health in an emerging outbreak.

Rather than try to develop operational procedures for each possible significant biological event that might occur, JAM team members can and should focus on developing flexible practices that can function under a wide range of circumstances. Each new outbreak situation will present unanticipated novelty, and the JAM—as the tissue connecting the WHO and the UNSGM—will need to be innovative, flexible, and not procedurally constrained, so it can best deal with the unique aspects of an outbreak.

We anticipate that the Secretary-General will choose to task the JAM with assessing the origins of outbreak situations after they arise. A possible but not exhaustive set of scenarios includes:
WHO submits an inquiry to examine the origins of a public health emergency of international concern, for which WHO is uncertain about origins or suspects they might not be natural.
The Secretary-General wants to examine a significant biological event that they believe is of uncertain or non-natural origin.

Once tasked with an assessment, the JAM can determine the additional information and evidence needed, with the aim of gaining more clarity about the origins of the biological event in question. The JAM's primary goal should be to work as an interface among UN system elements, without developing too much independent administrative capacity. Should some sort of field mission or investigation be indicated, the JAM could draw on the capabilities of WHO, the UNSGM or other relevant international entities.[4]

If the evidence points to deliberate origins, the responsibility for further action could shift to the use of the UNSGM, if a UN member state were willing to make a formal allegation of bioweapons use.[5] If, upon further examination, the event appears natural in origin, the responsibility would revert to WHO. (See *Figure 1* below.) In case of an accidental origin, the Secretary-General will make a contextual decision as to how to proceed.

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[4] Forming a mission team and sending people safely into the field would likely take weeks (at least) of planning, and we anticipate that in many situations, at a minimum WHO would have personnel already in place. The JAM's comparative advantage in such a case, for example, would probably lie in helping WHO identify new information that could help assess an origins question.

[5] If no state were willing to make such an allegation, even with the JAM's assessment of available evidence that deliberate use is likely to have occurred, the resolution would be the same as under current structures when a state fails to make an allegation.

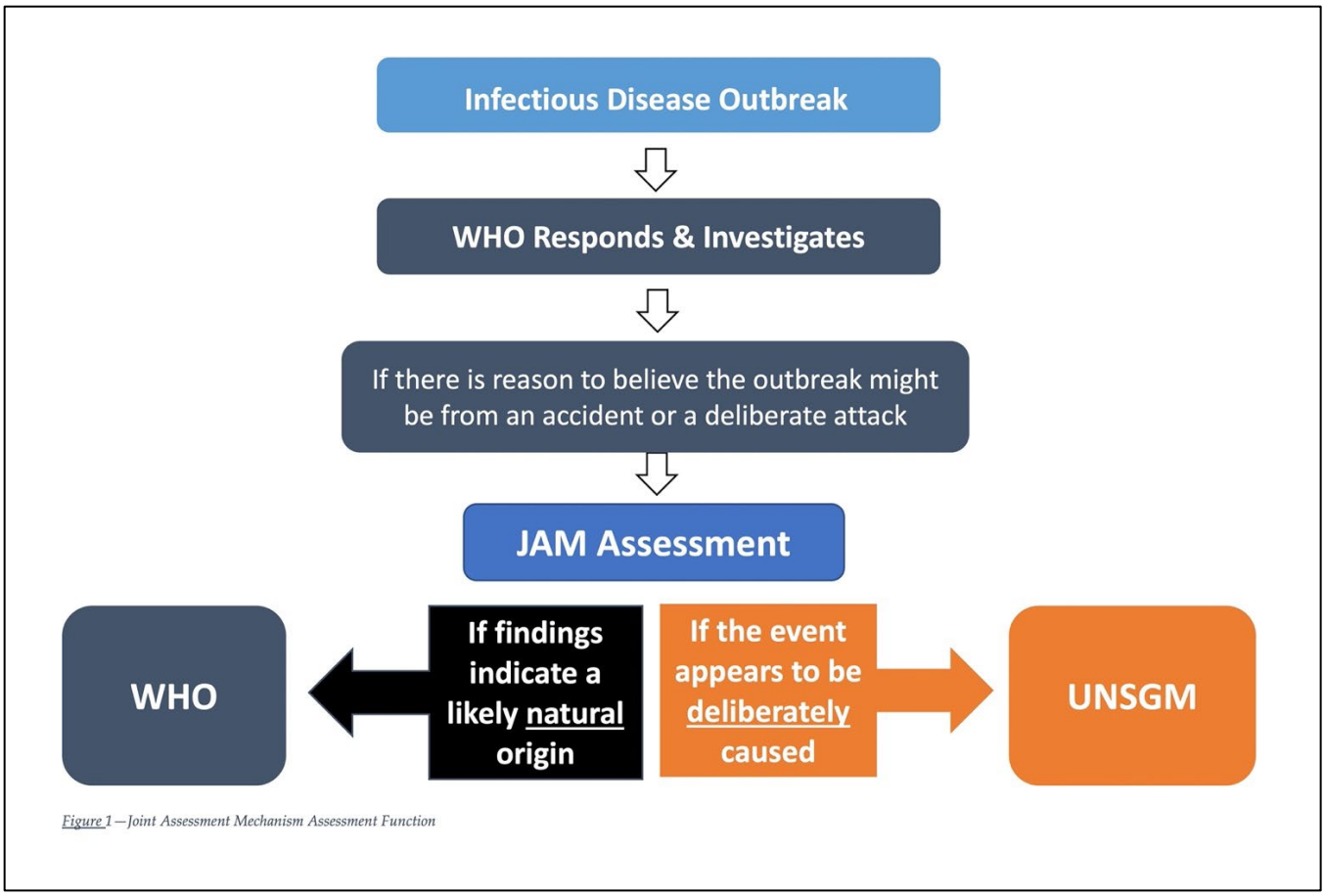

Figure 1. Joint Assessment Mechanism Function upon Activation

Technical and Operational Considerations for the JAM

The Joint Assessment Mechanism should take an approach that is evidence-based. It should include both a standing, "peacetime" capability with a small team responsible for integrating and analyzing data from multiple sources on an ongoing basis, as well as the capability to launch on-site assessments when activated. The JAM should take advantage of new tools, methods, and technologies, such as bioinformatics, data science, and artificial intelligence, to build a modern capability for analyzing a broad range of data to garner new insights about the biological risk landscape.

Operational Requirements

The JAM will be comprised of two core components: (I) standing capabilities for ongoing data analysis and assessment, and (II) activated assessment capability to conduct site visits on short notice to collect and analyze data during a public health emergency. The JAM will require a range of scientific, technical, and operational capabilities, including data collection and analysis. For site visits, the logistical infrastructure to mobilize a team of field deployable experts should come from UN peacekeeping missions or UN field offices in the affected region.

To ensure that it can use these core components, the Joint Assessment Mechanism will need at least the following operational elements:

- An international roster of deployable expert inspectors,
- A standing unit with capabilities for ongoing data analysis and coordination.

For capabilities like personnel transportation to the site of an outbreak, security, sample chain of custody provisions, inspector training and certification resources, or networks of laboratories, the Secretary-General should set the JAM up to make use of existing operational capabilities within WHO and the UN. Many of these capabilities should exist within the UN system already, under the use of the WHO and departments of the Secretariat. An important open question is how to facilitate sharing of resources most effectively across these various mechanisms; we welcome specific feedback in this regard.

Technical Considerations

Ongoing data collection and analysis that includes cooperation with partner organizations during "peacetime" will be critical for the JAM. The integration of traditional public health data, biosurveillance, and emerging non-traditional data sources will help to develop a strong baseline during a period when large outbreaks are not occurring so the JAM can more effectively identify signals associated with a natural, accidental, or deliberate origin of an ongoing outbreak.

The Joint Assessment Mechanism could collect, aggregate and analyze two broad categories of data:

- **Public health and biosurveillance data to understand the genetic and physical properties of pathogens in circulation.** These data would be collected and shared by WHO, national governments, and international resources like Health Map. Traditional epidemiological data such as the spatial and temporal distribution of cases is included within this category.

- Non-traditional (and generally publicly available) data sources that can provide information about the activities and intentions of organizations and individuals. These data could include:
    - social media,
    - financial transactions,
    - satellite imagery,
    - scientific publications/bibliometrics, and
    - other sources of publicly accessible information.

These data could, for example, provide insights about the location of high containment labs, locations where especially risky dual-use research of concern is underway, areas where terrorist groups are active, and information about activities and intentions of other key organizations and groups.

The JAM will need to consider how it validates data sources and analytical methods to ensure legitimacy in the eyes of the international community. The JAM should build in redundant methods of analysis to account for the uncertainty that any one of the methods above might contain. The JAM also needs to consider how it might be possible to collect data remotely, if on-site collection is challenging.

Data analysis that we expect the JAM to conduct will depend highly on context and the specific circumstances. This is why the JAM must integrate public health and biosurveillance data with the non-traditional sorts of data highlighted above. JAM staff may benefit from spending some portion of their analysis time crafting decision scenarios or simulations. Such exercises could help to craft flowcharts or other decision schemas that will help to rule out particular hypotheses in a given event. This work may also help to provide continuing training and readiness to JAM or UNSGM experts. Data analysis and scenario-testing will enable the JAM to validate its methods and experts in advance of an outbreak event.

Key Open Questions

Incentives to Cooperate

Further discussions are needed about how the international community can establish effective incentive structures for national government cooperation if and when the JAM requests access to conduct on-site assessments. Ultimately, cooperation by the affected country in question will be critical to a successful assessment. The global community must develop strong incentives and/or global norms for cooperation.