

report



INVESTIGATION OF ALLEGED USE OF BIOLOGICAL WEAPONS – STRENGTHENING THE UN SECRETARY-GENERAL’S MECHANISM

Una Jakob // Stefan Kloth // Ines Mergler

PRIF Report 7/2024

INVESTIGATION OF ALLEGED USE OF BIOLOGICAL WEAPONS – STRENGTHENING THE UN SECRETARY- GENERAL'S MECHANISM

Una Jakob // Stefan Kloth // Ines Mergler



Peace Research Institute Frankfurt
Leibniz-Institut für
Friedens- und Konfliktforschung



PRIF – PEACE RESEARCH INSTITUTE FRANKFURT
PRIF – LEIBNIZ-INSTITUT FÜR FRIEDENS- UND KONFLIKTFORSCHUNG

This PRIF Report is partly based on research carried out at PRIF for the joint research project CBWNet, funded by the German Federal Ministry of Research and Education.
This PRIF Report is partly based on research carried out at RKI for the project “Strengthening the UNSGM”, funded by the German Federal Foreign Office.

Cover:

Expert taking samples during 2022 Capstone Exercise for the UNSGM. Photo: © Bernd Bruckmoser

Text license:

Creative Commons CC-BY-ND (Attribution/NoDerivatives/4.0 International).
The images used are subject to their own licenses.



Correspondence to:

Peace Research Institute Frankfurt
Baseler Straße 27–31
D-60329 Frankfurt am Main/Germany
Telephone: +49 69 95 91 04-0
E-Mail: una.jakob@prif.org
<https://www.prif.org>

ISBN: 978-3-911092-00-5

DOI: 10.48809/prifrep2407

The use of biological weapons is universally prohibited, which means that no one may lawfully employ biological agents or toxins as a method of warfare or for other hostile purposes. Biological weapons attacks have been very rare in the past, but they could have grave consequences on international security as well as global health and societal and economic peace. Even the mere allegation that a biological weapon had been used could have severe effects, as it could excite strong psychological reactions and exacerbate international tensions and conflicts. It is therefore crucial that cases of alleged biological weapons use can be investigated independently and in a scientifically and technically sound manner.

The only international mechanism currently available to do that is the UN Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM). This mechanism was formally established by UN General Assembly Resolution 42/37C in 1987 and is administered by the UN Office of Disarmament Affairs in New York. It is under the sole authority of the UN Secretary-General and does not depend on decisions or actions by the UN Security Council. All UN member states can request a UNSGM investigation, provided that they can present sufficiently convincing evidence that a biological weapons attack may have taken place. After deciding to launch an investigation, the UN Secretary-General can assemble and dispatch a mission team on short notice, drawing on a roster of experts, expert consultants and laboratories previously nominated by UN member states. The mission would be tasked to "ascertain the facts of the matter" and report to the UN Secretary-General, who would then inform all UN members about the results of the investigation. Any UNSGM mission would follow the Guidelines and Procedures set out in UNGA Resolution 44/561 (1989), which cover all aspects and steps of an investigation from the initial request and the decision to launch an investigation, to the conduct of the investigation, all the way to submission of the final report.

There are several characteristics that make an investigation in the biological field particularly challenging and important. First, the agents – such as bacteria, viruses, fungi, or toxins – occur naturally, which means that their mere presence is not an indicator of deliberate dissemination. Second, infectious disease outbreaks with unclear origin are becoming increasingly likely and harbour the potential for suspicion and conflict. Third, biological research and biotechnology often have a dual-use character, which means that they usually follow benign intentions but may have a potential to be misused for nefarious purposes. Rapid developments in the life sciences and related technologies like artificial intelligence may further increase this risk. Fourth, changing patterns of conflict may have an impact on rationales for the use of biological weapons by non-state actors or even by states, for instance in small-scale or targeted attack scenarios exploiting the difficulty of attributing a biological weapons attack to a source. Considering all these circumstances, ensuring the readiness and effectiveness of the UNSGM to investigate a wide range of scenarios is essential.

The UNSGM is operational and could be used at any time to investigate an alleged biological weapons attack, as was most recently tested in a simulated full-scale investigation in the form of a Capstone Exercise in Berlin in 2022. Moreover, a number of activities to enhance its operability are already being undertaken, such as exercises and training activities for rostered experts and labora-

tories, among other things. At the same time, the mechanism is facing challenges that need to be addressed in order to maintain and strengthen it.

First, recent exercises have shown that despite the general viability of the mechanism and on-going efforts at reinforcement, there is still room for further improvement, for instance in intensified training efforts, in the broadening of available expertise and geographical representation on the roster, and in more detailed preparation for UNSGM investigations that might run in parallel with public health or law enforcement investigations of the same incident.

Second, scientific and technological developments in biology and biotechnology, coupled with advances in artificial intelligence, need to be monitored for their relevance to a UNSGM mission. On the one hand, there are developments, including some with dual-use potential, that could increase risks and complicate missions; on the other hand, developments in the area of detection and identification of pathogens, for instance, could be used to support an investigation. Artificial intelligence plays an ambivalent role, as it could support disinformation campaigns, but could also facilitate important investigation tasks.

Third, political initiatives aimed at enhancing the role of the UN Security Council in investigations of alleged biological weapons use and proposals to open the Guidelines and Procedures for revision have been criticised as attempts to undermine the UNSGM's independence (which is one of its major assets) and to call its current effectiveness into question. Given the crucial role the UNSGM plays in addressing allegations of biological weapons use, any attempts to undermine trust in the mechanism or its independence should be countered.

Three groups of stakeholders are singled out that could initiate and support activities to strengthen the UNSGM: UNODA, UN member states, and the disarmament research community. UNODA could continue its efforts to enhance the capacities and skills of the rostered experts and laboratories through training and exercises, and to expand the range of expertise and geographical representation on the rosters. It could also continue to raise awareness and provide guidance to all actors involved in, or otherwise affected by, a mission, including in concurrent public health and law enforcement investigations. UN member states could support UNODA's efforts in this regard through financial and practical contributions, and could actively counter political efforts to weaken the UNSGM. The disarmament research community could help inform stakeholders about the UNSGM and its relevance and help identify additional ways to strengthen the mechanism. Taken together, action by all three stakeholder groups could ensure that the UNSGM can play its part in achieving the goal set out in the preamble of the Biological and Toxin Weapons Convention (BTWC): to exclude once and for all the use of biological and toxin weapons.

Frankfurt, December 2024

1. Introduction	1
2. The Role and Importance of Investigations of Alleged Biological Weapons Use	3
2.1 Disease Outbreaks in a Global Health and Security Context	3
2.2 Means to Deal With Compliance Concerns Under the BTWC	5
3. The UN Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM)	7
3.1 Origins and History of the UNSGM	7
3.2 The UNSGM in Its Current Form	11
4. Strengthening the UNSGM: Technological Developments, Opportunities, Challenges, Political Context, and Activities	15
4.1 Technological Developments: Opportunities and Challenges	15
4.2 Political Context and Challenges	17
4.3 Activities to Strengthen the Mechanism	21
5. Conclusions and Recommendations	23

1. INTRODUCTION¹

The use of biological weapons is prohibited worldwide, and no country openly admits to possessing or developing these weapons. Yet, concerns regarding secret and illegal bioweapons-related activities have been expressed time and again, most prominently by China, Russia and the United States. More recently, Russia has turned its allegations into a disinformation campaign in which it has been accusing the United States and Ukraine of conducting prohibited biological activities on Ukrainian territory (Littlewood/Lentzos 2022; Jakob et al. 2022; Bioweapons Disinformation Monitor 2022; Zanders 2023). While these claims have not been backed up by credible evidence, they illustrate vividly how biological weapons can become a topic of contention and international tension, especially in an acute war situation, even if the weapons are not actually present. In the case of alleged use of biological weapons, the situation would likely be even more intricate and harbour even greater potential for escalation, especially if fuelled by disinformation campaigns – which represent an increasing concern in general. The possibility to investigate, confirm or refute allegations of biological weapons use independently is hence crucial to containing this risk.

The United Nations Secretary General's Mechanism for Investigation of Alleged Chemical and Biological Weapons Use (UNSGM) (UNODA d) provides such a possibility. It is an ad hoc mechanism under the authority of the UN Secretary General (UNSG). It was formalized in 1987 through a resolution of the UN General Assembly and has its legal basis in the 1925 Geneva Protocol “and any other relevant rules of customary law” (A/42/37C (1987), see ch. 3.1). Any UN member may request an investigation if it can present credible information that an attack with chemical or biological weapons may have occurred. The UNSG can then launch an investigation with the help of experts and laboratories that were previously nominated by UN member states (see ch. 3.2). UNSGM investigations do not require authorization by or approval of the UN Security Council (UNSC) and cannot be subjected to a veto of the five permanent UNSC members. This independence is a major strength of the mechanism. At the same time, it means that the UNSGM depends on the cooperation of the country on whose territory the investigation takes place, as the UNSGM does not have the authority to enforce an investigation. The UNSGM is operational and functional, but faces a number of practical, political and technological challenges that demand careful attention. This PRIF Report outlines the legal and political framework for UNSGM investigations, analyses the mechanism's relevance in today's international security and global health environment, describes its history, its functioning and its current state as well as the challenges it is facing, and discusses ongoing efforts and possible future activities aimed at supporting and strengthening the UNSGM.

With the entry into force of the Chemical Weapons Convention (CWC) in 1997, the establishment of the Organisation for the Prohibition of Chemical Weapons (OPCW) and their near-universal membership of 193 states, it is very likely that any incidents of alleged chemical weapons use would be dealt with by the OPCW, or at least with its support. Efforts to strengthen the UNSGM have therefore

¹ The authors are grateful to Kristoffer Burck, Patrick Flamm, Carmen García López, Elisabeth Hoffberger-Pippan, Iris Hunger, Veronika Klymova, Lukas Rademacher, Kadri Reis, and Fabian Unruh for their constructive comments and suggestions on an earlier version of this text.

been focused on alleged biological weapons use. The use of biological agents such as bacteria, viruses or toxins as weapons is prohibited by international law, including through the 1925 Geneva Protocol² which prohibits their use in warfare, and the prohibition of biological weapons use has also been established as an international customary rule (Henckaerts/Doswald-Beck 2005). In 2017, the use of “weapons, which use microbial or other biological agents, or toxins, whatever their origin or method of production”³ was moreover added to the list of war crimes through an amendment to the Rome Statute of the International Criminal Court (ICC).⁴ States are not only prohibited from *using* biological weapons, however, but the vast majority of all states have renounced biological weapons completely through their membership in the Biological and Toxin Weapons Convention (BTWC). The BTWC was opened for signature in 1972 and entered into force in 1975. As of November 2024, it had 187 States Parties.⁵ The near-uniform and consistent state practice of renunciation of biological weapons even beyond the BTWC indicates that the non-possession norm for biological weapons may have evolved into a universal norm as well. While the BTWC does not contain any reference to the use of biological weapons, States Parties have repeatedly affirmed that they consider such use as “effectively prohibited under Article I of the Convention” (BWC 2017: 9) which reads:

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain: (1) microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes; (2) weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Moreover, the UN Security Council (UNSC) has declared the proliferation of biological weapons a threat to international peace and security.⁶ There is thus a comprehensive prohibition of biological weapons in place,⁷ and no state could admit to possessing or having used biological weapons, or reserve the right to do so, without risking a massive loss of prestige and international standing as well as serious political and potentially military repercussions.

While the legal and normative basis for the non-possession and non-use of biological weapons is strong, there are currently few means available to determine possible violations of this prohibition. This is particularly problematic since it can be very difficult to distinguish between a biological weapons attack and a natural disease outbreak. The ambiguity of a disease outbreak without an

2 “Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare”, <https://treaties.unoda.org/t/1925> (31/10/2024).

3 <https://treaties.un.org/doc/Publication/CN/2018/CN.116.2018-Eng.pdf> (31/10/2024).

4 As of January 2025, 23 ICC member states had accepted or ratified the amendment, <https://asp.icc-cpi.int/RomeStatute> (31/10/2024).

5 <https://disarmament.unoda.org/biological-weapons/about/membership-and-regional-groups> (31/10/2024).

6 E.g. UN Security Council Resolution 1540 (2004) and follow-up resolutions (UN Security Council 1540 Committee).

7 On the origin of the biological weapons taboo see Bentley (2023).

identifiable source may have considerable political and security implications, including the exacerbation of tensions, the fuelling of misperceptions and disinformation, and consequent loss of trust as well as destabilising security and armaments dynamics (see Jakob 2020). Unfounded allegations of biological weapons use can incite similar dynamics, especially when they are obviously brought forward in bad faith. While such allegations do not automatically damage the norms against biological weapons themselves (Jakob 2024), they may sow suspicions and doubts about compliance with and commitment to these norms on the part of the accused and the accusing party. These potential implications make it all the more important that circumstances surrounding a suspected biological weapons attack can be investigated and clarified independently and based on expert knowledge (see Chapter 2). The UNSGM is currently the only mechanism that could fulfil this task (see Chapter 3). The mechanism has proven effective in past investigations of alleged chemical and toxin weapons attacks, most recently in Syria in 2013 (UN General Assembly/UN Security Council 2013b). However, so far it has never been activated to investigate a possible biological weapons attack.

This PRIF Report argues that the UNSGM is a valuable tool and will remain so for the foreseeable future. At the same time, the changing political and technological environment makes it necessary for the mechanism to be dynamic and adaptable to new challenges, and resilient in the face of political attempts to undermine its credibility and independence. The most promising and effective way to achieve this is by reaffirming strong political support for the mechanism and keeping it operationally up to date and flexible.

2. THE ROLE AND IMPORTANCE OF INVESTIGATIONS OF ALLEGED BIOLOGICAL WEAPONS USE

2.1 DISEASE OUTBREAKS IN A GLOBAL HEALTH AND SECURITY CONTEXT

The threat posed by biological agents being used as weapons has become increasingly complex and diffuse. On the one hand, there are scientific and technological developments such as genetic engineering techniques and applications of artificial intelligence and machine learning tools that were originally developed for peaceful purposes but could potentially be misused for malign intentions, including the development and use of biological weapons (e.g. Krin/Jeremias 2023; Reis 2024a; Revill et al. 2024). On the other hand, there are examples such as the outbreak of the Ebola virus in West Africa in 2014/15 or, in particular, the COVID-19 pandemic, which – even though not caused by a deliberate attack – show the potentially disastrous consequences of an infectious disease outbreak on a large or global scale. These illustrate the risks which disease outbreaks carry for economic and social stability, irrespective of a natural origin or an intentional release. In addition, disease outbreaks may increase the risk of a potential misuse of agents due to their increased availability (see Gera et al. 2017; Koch et al. 2020).

The 2014/15 Ebola Virus Disease outbreak in West Africa was by far the largest Ebola outbreak ever recorded and led to the establishment of the first UN Mission for Ebola Emergency Response

(UNMEER) (UNOCT 2017), as the UNSC determined in its resolution 2177 (2014) that the severity and scale of this outbreak posed a threat to international peace and security and therefore required an operational structure that would pool the capabilities and expertise of relevant UN agencies to strengthen operational leadership.⁸ The World Health Organisation (WHO) took the lead on the health-related aspects and declared a public health emergency of international concern.⁹ While this was a natural outbreak, some characteristics of the Ebola virus, such as the lack of effective specific treatment, vaccination against the virus, early diagnostic methods and adequate infection control equipment and resources, combined with the high mortality rate, correspond to some characteristics that could make a pathogen attractive as a biological weapons agent (Gera et al. 2017).

To date, more than 7 million people worldwide have died from the COVID-19 pandemic, some of them probably due to misleading information that thwarted coordinated efforts to save lives (WHO 2024b; Knight 2021). The pandemic has also had an unprecedented economic, political and societal impact on a global scale (Bonotti/Zech 2021). There are no serious allegations that the pandemic was caused by a deliberate attack. However, there is an ongoing debate about its origin, whether it was rooted in a natural zoonotic transmission to humans or a laboratory accident involving the unintentional release of a dangerous pathogen (Knight 2021). This debate has been fuelled by an at least partial lack of transparency on the part of state actors in China (UN News 2023), and also by the fact that circumstances surrounding an infectious disease outbreak can be highly complex such that it can be very difficult to distinguish between an accidental release, a deliberate dissemination, and a natural outbreak. This could be the case, for example, if the agent in question is a novel pathogen or endemic to the region where the outbreak probably originated. Moreover, any large-scale disease outbreak is very likely to be accompanied by misinformation and disinformation, potentially rendering the objective identification of the source of an outbreak even more difficult (McLeish/Moon 2020).

Determining the possible use of a biological weapon can be a highly complex scientific matter (Trapp 2023) and requires elaborate mechanisms and specialised expertise. In addition to laboratory evidence such as identification and characterisation of the pathogen including potential mutations or modifications, epidemiologic indicators can play an important role in distinguishing bioweapon attacks from natural disease outbreaks with a high degree of confidence. Besides atypical characteristics of a pathogen (severity of disease, pathogenicity, lethality, effectivity of medical countermeasures), such indicators may include anomalies in the geographic or seasonal distribution of cases, and unusual occurrences of disease in certain populations or age groups (Knight 2021).

The question of the origin of a disease outbreak is, however, not only relevant from a scientific and epidemiological perspective, it is also of great security importance. Biological weapons attacks have been extremely rare, and while there were previously extensive biological weapons programmes, for example in the USA and USSR, there are currently no publicly confirmed and few suspected state-run

8 UN Security Council Resolution S/RES/2177 (2014), 18 September 2014, <https://documents.un.org/doc/undoc/gen/n14/540/84/pdf/n1454084.pdf> (22/11/2024).

9 <https://news.un.org/en/story/2014/08/474732> (22/11/2024).

offensive biological weapons programmes worldwide (Carus 2017).¹⁰ Biological weapons have not had a prominent place in the traditional military strategies and arsenals of most states. However, they have some characteristics that might make them more attractive for specific scenarios of use by states and non-state actors such as terrorist groups, especially given some changes in warfare and technology (see Ilchmann/Revill 2014). These characteristics include their delayed time to effect, the potentially significant disruptive material and psychological effects on economies and societies, and not least the difficulty of identifying a deliberate attack and attributing it to a source, as described above.

Apart from actual attacks, mere allegations of biological weapons use, no matter how (un-)substantiated, could also trigger destabilising dynamics, as they could intensify political tensions between adversaries, create mistrust which may cause additional security problems, or contribute to the escalation of existing conflicts. The ability to confirm or refute such allegations independently and authoritatively is hence an important factor in the efforts to maintain international peace and security. This is all the more important given the increasingly problematic role of mis- and disinformation, as illustrated by the example of the Russian campaign against the USA and Ukraine (see Chapter 1; Jakob 2024; Lentzos/Littlewood 2022; Zanders 2023).

2.2 MEANS TO DEAL WITH COMPLIANCE CONCERNS UNDER THE BTWC

Neither the BTWC nor the Geneva Protocol provide for any investigation mechanisms in the case of alleged use of biological weapons. Rather, under the BTWC, confirmation that a biological attack has taken place would either have to come from the UNSC or be obtained through consultations among BWC States Parties. According to the BTWC, BTWC States Parties can request the UNSC to address and investigate grave compliance concerns under Article VI or to determine a violation of the BTWC to trigger the provision of assistance under Article VII.¹¹ However, due to the ongoing political challenges in the UNSC, the chances for consensus among all UNSC members on the launch of an investigation of BTWC violations depend on the circumstances and actor constellations at hand, but seem generally slim.

Under Article V of the BTWC, States Parties can consult with one another in case there are “problems in the implementation of the Convention”. Procedures for consultative meetings were devised in

10 Known past possessor states, with programmes of varying sizes, include Canada, France, Germany, Iraq, Japan, South Africa, the UK, the USA, and the USSR. Biological weapons programmes of unknown extent are currently suspected to exist in North Korea, Russia and possibly Syria, while there is uncertainty about the status of Israel's biological weapons activities (Carus 2017; Harris 2020; Petersen 2022; Wheelis et al. 2006; <https://www.nti.org/countries/> [25/11/2024]; <https://www.armscontrol.org/factsheets/chemical-and-biological-weapons-status-glance> [25/11/2024]).

11 In the context of COVID-19, Himmel and Frey (2022) have described the coordinated response that the BTWC regime offers to member states in the event of a potential bioweapons attack. This could include mutual assistance such as providing resources and capabilities for pathogen detection and diagnosis.

1986 and 1991.¹² They were applied twice: in 1997, when Cuba accused the USA of having disseminated a plant pest over Cuban territory (Zilinskas 1999); and in 2022, when Russia accused the USA and Ukraine of carrying out biological weapons-related activities (Jakob 2024; Lentzos/Littlewood 2022; Zanders 2023). Neither meeting was able to reach definitive conclusions, which is not surprising given that this would have required a consensus among all participating states and that the accusing and accused countries themselves were part of the process in both cases.

The example of Russia's ongoing disinformation campaign against the USA, Ukraine and others (Leitenberg 2021; Zanders 2023) illustrates vividly that spurious allegations regarding biological activities can also play a role in compliance-related processes, as can misperceptions of another state's capabilities or intentions. One way to reduce the risk stemming from such spurious allegations or misperceptions is to enhance transparency, including in biodefence activities, as transparency makes it more difficult to spread, and easier to counter, disinformation. Confidence-building measures (CBMs) were introduced in the BTWC regime back in 1987 (UNODA), requiring States Parties to submit, inter alia, information on their research on topics related to high-risk biological agents, national biodefence-related research sites and vaccine production. Providing this information is a politically binding obligation for all States Parties. CBMs are not a tool to verify compliance with the BWC. However, were their potential to be fully exploited, they could help establish regular patterns of biological activities, which could then help detect deviations or, in combination with other information, help assess the plausibility of bioweapons-related allegations. However, there are no sanctions for those who do not submit their CBMs, and while there have been constant increases in the number of submissions especially in recent years, overall participation has tended to be low.¹³ Moreover, given that there is no collective follow-up procedure for analysis, for checking the accuracy and completeness, or for clarification of inconsistencies of all CBMs, the added value in terms of enhanced transparency and prevention of misperceptions and mis- or disinformation has been limited in practice.¹⁴

Peer review exercises and transparency visits have emerged as a new concept in the BTWC since the early 2010s (see Espoña 2024). This cooperative approach aims at demonstrating States Parties' commitment to the implementation of and compliance with the BTWC and at dispelling suspicions.¹⁵ However, not all BTWC members accept the concept politically, and while this approach has its merits

12 Final Documents of the Second and Third BWC Review Conference, BWC/CONF.II/13/II, pp 5-6; BWC/CONF.III/23, p. 15-18.

13 The number of submissions rose above a share of 50 % of all States Parties for the first time only in 2021, and reached an all-time high at 59 % (111 submissions) in 2024. UNODA, BWC ISU, CBM Report Submissions, <https://bwc-cbm.un.org/> (03/02/2025).

14 On the civil society side, the Research Group for Biological Arms Control at the University of Hamburg has published reports on the publicly available CBMs since 2008 (<https://www.biological-arms-control.org/publications.html>).

15 Georgia, for instance, invited a group of international observers to a biological facility in 2016 to demonstrate that only peaceful and legitimate activities were being conducted there. This transparency visit was a reaction to Russian accusations that illegal weapons-related activities were carried out there. See Georgia, Germany et al. (2018), Building Confidence through Transparency: Peer Review Transparency Visit at the Richard Lugar Center for Public Health research of the National Center for Disease Control and Public Health in Tbilisi, Georgia, BWC/MSP/2018/WP.5, 3 December 2018.

in enhancing transparency and confidence, it would not be suitable to address allegations as grave as a biological weapons use.

A legally binding verification and investigation system could be a way to enhance confidence in compliance with the BTWC and detect and deter violations of the norms against biological weapons, including the non-use norm. Negotiations on such a system began in 1994 but collapsed in 2001. The topic of verification was then no longer discussed substantially in the official BTWC meetings until 2022, when the 9th Review Conference decided to include verification and compliance in the agenda of the new BTWC Working Group.¹⁶ While this was a positive step, there are still many obstacles to be overcome before negotiations on a verification system can start anew. These obstacles include, for example, diametrically opposed political positions regarding the verifiability of relevant biological activities and the objectives verification could or should achieve, as well as a lack of conceptual clarity and of sound technological assessments about available, appropriate and feasible verification measures. Investigations of alleged BTWC violations, including biological weapons use, could be part of a verification system if BTWC states parties so decide, but in the absence of such a system, a dedicated investigation mechanism for the BTWC is not likely to materialise for the time being.

The UNSGM is not formally linked with the BTWC. Rather, it is available to all UN members, and it could be applied to various scenarios of alleged biological weapons use.¹⁷ A state could request an investigation if it suspects that it has been attacked with a biological weapon, or if it wishes to refute an allegation of having used biological weapons against another state. In case of suspected biological weapons use in an intra-state conflict, the ruling government could request an investigation to confirm or refute an alleged attack, or a state not party to the conflict could make that request if the ruling government itself is incriminated. Finally, a UNSGM investigation could be requested in case of an attack of unclear origin, including possible cases of state-sponsored or other acts of bioterrorism.

Motives for a state to request a UNSGM investigation could include a lack of the specific resources required to investigate a suspected deliberate biological attack at the national level, but also a political interest to have the results of previous domestic investigations impartially and internationally confirmed or supplemented, to gather supporting evidence for accusations against an adversary (especially if the investigation is expected to yield indications for the origin of an outbreak), or to objectively refute allegations brought forward against it by another state. The UNSGM thus represents a valuable tool for states to deal with allegations of biological weapons use in various scenarios.

16 Final Document of the Ninth Review Conference, BWC/CONF.IX/9, p. 10, <https://documents.un.org/doc/undoc/gen/g22/617/94/pdf/g2261794.pdf> (31/10/2024).

17 While the BTWC prohibits the development, possession and transfer of biological weapons, among other things, the UNSGM is currently mandated only to investigate their alleged use.

3. THE UN SECRETARY-GENERAL'S MECHANISM FOR INVESTIGATION OF ALLEGED USE OF CHEMICAL AND BIOLOGICAL WEAPONS (UNSGM)

3.1 ORIGINS AND HISTORY OF THE UNSGM

The UNSGM in its current form originated in the late 1970s and early 1980s when then UN Secretary-General (UNSG) Kurt Waldheim and his successor Javier Perez de Cuellar carried out investigations in Laos, Cambodia (Kampuchea at the time) and Afghanistan.¹⁸ The UNSGM then evolved over a decade through a series of UN General Assembly (UNGA) resolutions and in light of experiences gained from the early investigations. It developed from an ad hoc instrument to investigate specific allegations to the current permanent and more elaborate mechanism.

With the first of the pertinent resolutions, UNGA Resolution 35/144C (1980), the UNGA decided to “carry out an impartial investigation to ascertain the facts pertaining to the reports regarding the alleged use of chemical weapons [...]” and requested the UN Secretary-General to conduct this investigation “with the assistance of qualified medical and technical experts”. The UNSG launched investigations in 1981 and 1982 and intended to dispatch experts to Laos, Cambodia, Vietnam and Afghanistan. The United States had accused the Lao and Vietnamese military of using chemical and toxin weapons against the Lao Hmong tribe. It also reported Vietnam’s use of chemical weapons in Cambodia (then Kampuchea), and also claimed that the Soviet Union was using chemical weapons in Afghanistan (Littlewood 2006: 10). However, because none of the accused governments were willing to cooperate with the investigators, no on-site activities were possible. Despite some significant findings pointing to “the possible use of some sort of toxic chemical substance in some instances”, the experts could not determine definitively whether chemical weapons had been used (UNGA 1982: 50). Independent non-governmental experts later concluded from the publicly available information that the so-called ‘yellow rain’ incidents likely had a natural cause (Robinson et al. 1987: 110–117).

Shortly after the UNSG submitted the final report of the official investigations to the UNGA in December 1982, a second UNGA resolution (37/98D) more generally requested the UNSG to investigate possible violations of the Geneva Protocol or of other relevant rules of international customary law. It also requested that the Secretary-General compile and maintain lists of experts and of laboratories that could assist in such investigations, and devise procedures that would guide the “timely and efficient” investigation of alleged chemical or biological weapons (CBW) use. According to the voting records, the political positions of UN members were polarised along East-West lines, with Western countries voting in favour of the 1980 and 1982 resolutions and the USSR and its allies voting against.¹⁹

¹⁸ A detailed account of the UNSGM’s evolution and of the investigations up until 2006 is provided in Littlewood (2006).

¹⁹ In 1980, 78 states voted in favour of the resolution, 17 voted against it and 36 abstained (UN Digital Library 1980). In 1982, 86 states supported the resolution, 19 rejected it and 33 abstained (UN Digital Library 1982). In the UNGA, every UN member has one vote. Unlike in the UNSC, there are no veto powers, and UNGA resolutions are not legally binding on UN member states.

Later in the 1980s, UNSG Perez de Cuellar mandated several investigations of alleged chemical weapons use in Iran, even though he was at times faced with strong political opposition and pressure not to launch investigations (Robinson 1985: 182). Different from the earlier missions which did not reach definitive conclusions, the experts this time unequivocally confirmed that chemical weapons had been used multiple times against Iran (Littlewood 2006: 14-15). Western states and the UNSC, among others, subsequently called out Iraq as perpetrator, and Iraq admitted to having used chemical weapons against Iraqi Kurds in the village of Halabja in 1988 (Goose 1987: 304; Lundin et al. 1988: 114; Lundin 1989: 100–101). The USA and the USSR both initially opposed the investigations in Iran, though for different reasons: “The Soviet Union was apparently opposed because it viewed the instrument as impinging on the prerogatives of the UNSC to decide when, where, and if, any investigations were to be conducted. [...] The US, for instance, hoped that Iraq would prevail over Iran and consequently was prepared to turn a blind eye to alleged Iraqi transgressions” (Littlewood 2006: 14). However, the extent of CW use and international public pressure apparently shifted the political calculus, and in 1987 UNGA Resolution 42/37C was adopted without a vote (UN Digital Library 1987). This resolution

requests the Secretary-General to carry out investigations in response to reports that may be brought to his attention by any Member State concerning the possible use of chemical and bacteriological (biological) or toxin weapons that may constitute a violation of the 1925 Geneva Protocol or other relevant rules of customary international law in order to ascertain the facts of the matter, and to report promptly the results of any such investigation to all Member States (op. para 4).

Among other things, the resolution called for the further development of technical guidelines and procedures that would facilitate timely and efficient investigations. The UNSG in 1989 presented a report to the UNGA that contained such guidelines and procedures and operationalised the new mechanism (44/561 (UNGA 1989; Littlewood 2006: 16–18)). The UNGA endorsed the guidelines and procedures by consensus in 1990 through Resolution 45/57C (UN Digital Library 1990).

Year	Document No.	Content	Voting results (yes – no – abstention)
1980	UNGA A/35/144C	Request for impartial investigation of allegations of CW use in Indochina and Afghanistan with support of “qualified medical and technical experts”	78 – 17 – 36
1982	UNGA A/37/98D	General request to UNSG to investigate allegations of CBW use, to compile and maintain lists of experts and laboratories, and to devise procedures for investigations	86 – 19 – 33
1987	UNGA A/42/37C	Establishment of permanent mechanism incl. guidelines and procedures	Adopted without a vote
1988	UNSC Res. 620	Recognition of SG investigation mechanism	
1989	UNGA A/44/561	Report of expert group, contains guidelines and procedures for UNSGM investigation	Adopted without a vote
1990	UNGA A/45/57C	Endorsement of guidelines and procedures contained in A/44/561	Adopted without a vote

Table 1: Resolutions and documents developing and supporting the UNSGM

In addition to this endorsement by the UNGA, the UN Security Council in 1988 recognised the establishment of the mechanism through its Resolution 620, and in 1989 a meeting of the parties to the 1925 Geneva Protocol also expressed appreciation of the new mechanism (Littlewood 2006: 18). The UNSGM thus received universal support and is based on a strong foundation politically and legally.

Year	Countries involved	Requesting state	Allegation	Results of investigation
1981-82	Laos, Vietnam, Cambodia (Kampuchea)	USA	Use of CW and toxins (“Yellow Rain”)	Inconclusive
1981-82	Afghanistan	USA	Use of CW and toxins	Inconclusive
1984-88	Iran, Iraq	Iran	Iraqi use of CW against Iran	CW use confirmed in Iran and Iraq
1987	<i>Establishment of UNSGM</i>			
1992	Mozambique	Mozambique	CW use in domestic conflict	Inconclusive
1992	Azerbaijan	Armenia	Refuting allegations of use brought forward by Azerbaijan	No evidence for CW use
2013	Syria	Syria, France, UK, USA	CW use in Syrian civil war	CW use confirmed in 4 cases, inconclusive in 3 cases

Table 2: Investigations by the UN Secretary-General of alleged chemical and toxin weapons use

After its establishment in 1987, the UNSGM was activated three times in addition to the investigations in Iran which continued into 1988.²⁰ In 1992, the mechanism was used to investigate the alleged use of chemical weapons in Mozambique and in Azerbaijan. In the first case, when the government of Mozambique accused the Mozambican National Resistance (RENAMO) of having carried out a chemical attack, the investigation was inconclusive and could not confirm that such an attack had indeed taken place. In the latter case, Armenia requested an investigation to refute the allegation that it had employed chemical weapons against Azerbaijan. Here, the UNSGM team found no evidence that chemical weapons had been used (Littlewood 2006: 19; Stock 1993: 261–262). The UNSGM then lay dormant for two decades before it was activated again in 2013 to investigate the alleged use of chemical weapons in Syria (Hart 2014: 389–398). The mission team investigated a total of seven alleged chemical weapons attacks and confirmed the use of chemical warfare agents in four cases (UNGA/Security Council 2013b), including the major Sarin attack on Ghouta near Damascus on 21 August 2013 (UNGA/Security Council 2013a). In the wake of this attack, Syria came under pressure from Russia and the United States to accede to the Chemical Weapons Convention (CWC) and dismantle its chemical weapons arsenal and infrastructure (Makdisi/Pison Hindawi 2017; Trapp 2014). After Syria had become a member of the CWC, the Organisation for the Prohibition of Chemical Weapons (OPCW) was responsible for verifying Syria's chemical disarmament and investigating further alleged chemical weapons attacks. The UNSGM was hence no longer involved in subsequent investigations in Syria and has not been activated since.

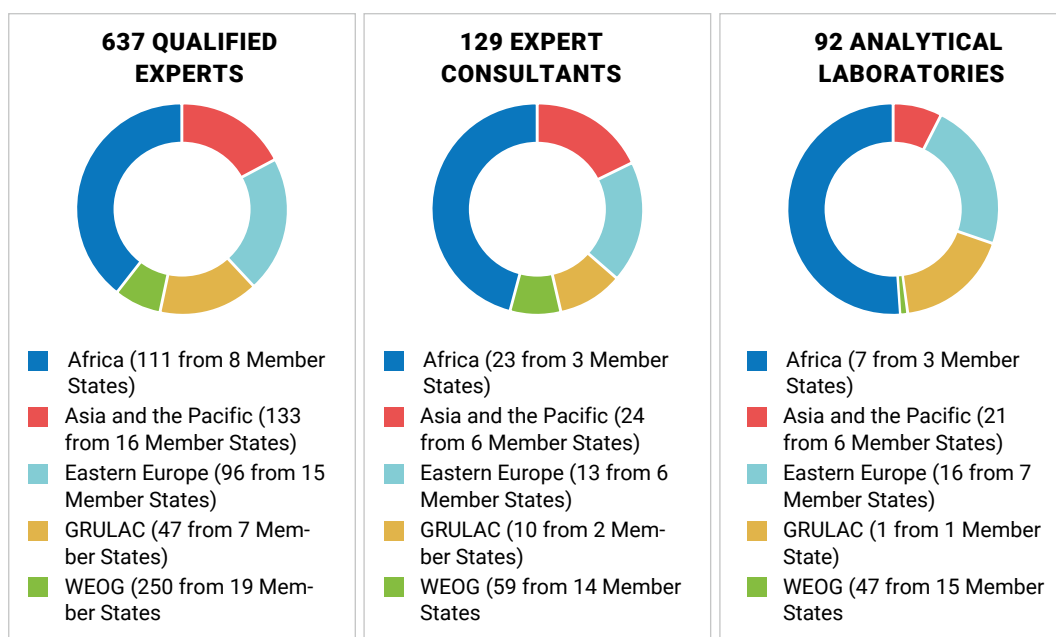
3.2 THE UNSGM IN ITS CURRENT FORM

As stated in the 1987 UNGA resolution, the UNSGM is mandated to ascertain the facts of a suspected chemical or biological weapons attack and possibly identify its origin. Depending on the specific mandate of a given mission, this could mean simply confirming whether or not a biological weapons attack took place, or additionally tracing the attack to a location, a laboratory or those responsible for the attack. While the possibility of attribution is at least implicitly included in the UNSGM's general mandate, it would depend on the request made to the UNSG, the given circumstances and the political context to what extent, if at all, attribution would be included in a mission mandate. A UNSGM mission might be conducted in parallel with international or national public health and law enforcement investigations, but it would have a distinct character and be carried out independently of such investigations.

The UNSGM is dependent on resources provided by UN Member States as no dedicated standing capacity is allocated. The main capacities in terms of personnel for a UNSGM mission are based on a roster maintained by the UN Office for Disarmament Affairs (UNODA) which includes expert consultants who may support the Secretary-General in his or her decision-making, qualified experts available for deployment on an investigation mission, and designated laboratories for analysing samples. All UN Member States can nominate individuals and laboratories to the roster to ensure a geographically balanced approach. As of November 2024, 129 expert consultants, 638 qualified experts and

20 The reports of the three UNSGM investigations in Mozambique (1992), Armenia/Azerbaijan (1992) and Syria (2013) are available on the UNODA website dedicated to the UNSGM (UNODA d). See also Littlewood (2006: 19).

92 designated laboratories were on the list maintained by UNODA (UNODA d; UNODA 2024b). This list is kept confidential for security reasons and by the request of some member states; UNODA publishes only statistics regarding the regional distribution of rostered experts, expert consultants and designated laboratories (see below), but does not reveal their nationality or names.



Graphic 1: Regional distribution of rostered experts, expert consultants and analytical laboratories as of November 2024, source: UNODA d

As mentioned before, the Guidelines & Procedures (G&P) as set out in UNGA document A/44/561 (1989) and endorsed by the UNGA in Resolution A/45/57C (1990) provide the framework for the UNSGM. In 2007, at the initiative of UNODA (then UNDDA) and encouraged by UNGA Resolution A/RES/60/288 (UNGA 2006), the guidelines were reviewed by a group of expert consultants and the appendices subsequently updated.

The Guidelines & Procedures describe not only the requirements for initiating an investigation, but also the tasks and responsibilities of the individual actors involved (Secretary General, expert consultants, qualified experts, designated laboratories, and host country). In addition, the Guidelines & Procedures provide information on requirements for, among other things, mission planning, equipment, sampling, interviews and the report. It is of utmost importance for all elements of a mission that the chain of custody for all evidence can be guaranteed and that the results of the mission can withstand scientific, political and legal scrutiny by the UN Member States.

The Guidelines & Procedures serve as a framework for UNSGM missions, but they are nevertheless intended to leave room for manoeuvre in order to be applicable to the many different chemical and biological scenarios that could be the basis for a mission. This is obvious, for instance, from

the variety of viruses, bacteria or biological toxins which could be used against humans, animals or plants. In addition, the geographical and political context in which future investigations would take place cannot be predicted, and the UNSGM could be applied in cases of chemical or biological weapons use by states, state-sponsored terrorists or other non-state actors.

In order to activate the mechanism, there must be sufficient reason to suspect that the Geneva Protocol or other relevant rules of customary international law were violated, i.e., that chemical or biological weapons were used. Any UN Member State can pass on relevant information to the Secretary-General and request an investigation (G&P, para. 25–27 and Appendix I). The Secretary-General evaluates the available evidence, if necessary with the assistance of expert consultants, and should announce a decision within 24 hours (G&P, para. 28–32). There are only a few circumstances in which the UNSG would be justified in not dispatching an investigation team, including, for example, insufficient evidence or security concerns for the mission team (G&P, para. 33).

The UNSC does not have a formal role in the UNSGM's proceedings, leaving the mechanism unaffected by possible deadlocks and vetoes in the UNSC. In practice, it is possible or even likely that the UNSG would consult with UNSC members prior to launching an investigation, as has happened in the past (Littlewood 2006: 14). However, at times UNSGM investigations were launched despite political pressure not to do so, as Jez Littlewood reports with regard to the early investigations in Iran (Littlewood 2006: 17). It is a political decision by the Secretary-General to inform the UNSC prior to launching a mission, not a precondition for the mission to take place; legally, the Secretary-General is independent in the decision about whether or not to launch an investigation when requested to do so by a UN member state. Given the difficult political situation in the UNSC, which generally reflects the state of world politics, this independence is one of the major assets of the UNSGM.

The Guidelines & Procedures stipulate that once the UNSG has decided to launch an investigation, a team should be dispatched within 48 hours (G&P, para. 32). Experience from the Syria mission in 2013, however, shows that this timeframe may often be difficult to meet for practical reasons.²¹ In preparation for the mission, the Secretary-General selects team members, who will be tasked with planning and carrying out the investigation, and notifies three selected laboratories (G&P, paras. 92–93). The mission is also preceded by negotiations with the country where the alleged incident took place to agree on access and to facilitate effective cooperation (G&P, para 90).

On site, it is the team's task to gather relevant facts and to assess the nature and extent of the incident (G&P, para. 94). This includes securing evidence such as environmental and biomedical samples, conducting interviews with suspected victims and witnesses as well as with local authorities and international organisations in the country, and exploring possible plausible narratives of the incident in question (G&P, paras. 94–100).

The collected samples will subsequently be sent to the three laboratories that were selected in advance, and are initially analysed by two of these laboratories. If the two laboratories come to di-

21 It took five months from the activation of the mechanism until a team was dispatched (UNODA 2013).

verging conclusions, the third one can be consulted (G&P, para. 97 d, ii). The results of the laboratory analyses, which can provide further indications as to whether the biological agent in question was released intentionally, are included in the final report. The UNSGM compiles the report, which is then submitted to the UNSG and UN Member States (G&P, paras. 101–102). The challenge in writing the report is that all data and conclusions must not only be scientifically valid, but the mission team also needs to demonstrate that the integrity and independence of the mission was upheld, as the results might also be challenged for political reasons (Trapp 2023: 5).

Such a complex mission with its high demands on the team requires close cooperation among all stakeholders involved. During the Syria mission in 2013, several UN departments, the World Health Organisation (WHO) and OPCW were heavily involved in coordinating and supporting the mission team. The various aspects of cooperation were reviewed during a lessons-learned workshop after the investigation. This review resulted in a recommendation to improve the exchange between relevant UN departments such as UNODA, the Office of Legal Affairs (OLA), the Department of Political and Peacebuilding Affairs (DPPA), the Office for the Coordination of Humanitarian Affairs (OCHA), the Department of Operational Support (DOS) and the Department for Safety and Security (DSS) (UNODA 2015: 11). This led to the establishment of an internal UN task force for the UNSGM, which is coordinated by UNODA (UNODA d). Apart from addressing internal cooperation, the UN also concluded memorandums of understanding for the UNSGM with WHO and the World Organisation for Animal Health (WOAH), as well as a Supplementary Agreement with OPCW. An agreement with INTERPOL is planned (UNOCT 2017: 16), but as of November 2024 had not yet been finalised.

In addition to the involvement of international organizations within and outside the United Nations, the state being investigated is a crucial actor for a mission. Without the cooperation of the host country, it is not possible for the mission team to carry out an investigation. All UN members are expected to “provide assistance to the Secretary-General, at his [or her] request, necessary to facilitate preparation for and conduct of any investigation” (G&P, para. 22) and to “grant rapid access to the team of qualified experts sent on his [or her] behalf to the site of the alleged violation of the 1925 Geneva Protocol and other relevant rules of customary international law” (G&P, para. 23). Moreover, UN members should not refuse a request of the UNSG to carry out an investigation (G&P, para. 23) and should support the mission team as required and necessary for a “timely and efficient” investigation (G&P, paras. 43–55).

In practice, however, the level of cooperation will vary depending on the circumstances of the investigation. If the host country itself requested the investigation, cooperation with the UNSGM team is more likely to be smooth, although even then friction might arise between local public health or law enforcement authorities investigating the incident nationally and the UNSGM mission team. If another country requested the investigation, the host country might be more reluctant to cooperate, which could delay the start of an investigation in case of prolonged pre-mission negotiations and which would make the UNSGM mission even more challenging. The importance of the country’s willingness to cooperate was emphasised in the aftermath of the Syria mission as a key aspect for future missions (UNODA 2015: 10).

Finally, coordination between the mission team and the laboratories is an important factor for an investigation. In order for the designated laboratories to be able to analyse the samples in the best possible way, it is essential that they are involved in all sampling-related processes not only throughout the preparation phase, but also during the mission “to ensure that samples are selected, collected and managed correctly” (Trapp 2023: 13). Moreover, for the preparation of the investigation report, it is crucial that the laboratory results be presented to the team in an unambiguous way. A good understanding between qualified experts and designated laboratories should hence be seen as a two-way communication.

The Guidelines & Procedures provide a comprehensive yet broad enough framework for an investigation of alleged chemical or biological weapons use to guide a UNSGM mission in its specific context. Yet, technological and political developments require attention to ensure that the mechanism remains up to speed for current circumstances.

4. STRENGTHENING THE UNSGM: TECHNOLOGICAL DEVELOPMENTS, OPPORTUNITIES, CHALLENGES, POLITICAL CONTEXT, AND ACTIVITIES

4.1 TECHNOLOGICAL DEVELOPMENTS: OPPORTUNITIES AND CHALLENGES

In order to discuss the relevance of current technological developments for the UNSGM, it is important to understand the unique task that an investigation into an alleged biological attack presents for a mission team and the designated laboratories. In contrast to a case of suspected chemical weapons use where a mission would need to confirm whether a chemical agent is present at the site of the alleged incident, bacteria, viruses and biological toxins occur naturally. Hence, their identification at a given site does not indicate per se whether the mission team faces a deliberate use or whether the incident was caused by an accident or by a natural outbreak (Spiez 2015: 13).

There are, however, indicators to differentiate between those possibilities, and technological progress offers opportunities for better tools and methods for investigation (Spiez 2015: 5). For example, there are more options available nowadays to rapidly identify and analyse pathogens, thanks to advances in genetic engineering as well as other detection and identification technologies (e.g. Reis 2024b). In the laboratory, technological solutions for sample analysis are continuously being developed. This results in an ever-increasing amount of information that can potentially be retrieved. Another area of opportunity is the use of open-source data (see e.g. Zmorzynska/Jeremias 2012: 8–10), for instance, to identify early signs of irregular activities in trade, which may suggest procurement for a clandestine weapons programme or for preparing a biological attack. For example, the noticeable increase in imported biological culture media by Iraq in the 1990s caught the attention of investigators from UNSCOM, whose inspectors ultimately revealed the existence of a biological weapons programme there (Borrett et al. 2020: 17–18). And a potential bioterrorist attack with the toxin ricin was prevented in Cologne, Germany in 2017 partly because the perpetrator’s online order of large amounts of castor beans – from which ricin can be produced – alerted intelligence and law

enforcement agencies (Flade 2018). Screening and analysing publicly accessible data may provide an investigating team with hints as to which biological agents to look for and may more generally deliver information that helps establish a probable chain of events. Although those indicators do not provide proof on their own, their accumulation can support an initial suspicion. Artificial intelligence (AI) tools may be useful in gathering and structuring the data, though the team would still need to evaluate the results and put them in a political context.

However, technological progress may also broaden the range of scenarios that could trigger a UNSGM investigation. Advances in the life sciences provide for a heightened potential for misuse due to the dual-use nature of many experiments, for example when they increase the contagiousness or pathogenicity of pathogens, or induce immune evasion or drug resistance (Appelt et al. 2021: 1). There are legitimate rationales for these kinds of experiments, such as in pharmaceutical or medical research. Hence, even if pathogens identified in an outbreak display signs of genetic engineering, including gain-of-function modifications, this does not automatically imply a deliberate attack, as the pathogens could also have been accidentally released from a regular laboratory. At the same time, dual-use experiments harbour the risk that benign research results could be intentionally misused for biological weapons purposes.²² In addition, AI with its manifold applications creates an additional layer of security risks. For example, AI applications that are used for drug design, retrosynthesis planning, and synthetic biology might allow malicious actors to direct their research to and reduce barriers to the development of biological weapons (Krin/Jeremias 2023: 2).

AI might not only affect the potential capability to develop and produce biological weapons; it could also have negative implications during an outbreak and a subsequent investigation. The potential of AI to contribute to the spread of mis- and disinformation has raised increasing concerns over the past years, with the recent example of the COVID-19 pandemic where AI-generated chat bots contributed to the spread of false information, for example regarding the use of face masks (Ayers et al. 2021). It can therefore be expected that future UNSGM investigations will likely face similar challenges and will need the appropriate expertise to recognise and deal with disinformation.

The fact that research and technology are developing so quickly calls for the UNSGM to be prepared to adapt and keep up with these changes and to ensure that relevant expertise is represented on the rosters of experts and laboratories. For example, bioinformatic skills and knowledge in molecular forensics are required to identify genetically engineered pathogens, and such requirements need to be considered by Member States when they nominate experts or laboratories for the UNSGM roster.

It has also long been recognized that designated laboratories should aim to prepare for the complexities and the specific challenges a biological weapons investigation presents. Since 2015, the Spiez Laboratory in Switzerland has taken the initiative to exchange experiences and best practic-

22 It should be noted that such high-end capabilities would most likely be available to only some states and could hence probably be employed only in state-run or state-sponsored biological weapons programmes, if at all. Non-state actors, and states without access to cutting-edge technologies and equipment, would more likely resort to more traditional technologies and existing pathogens should they intend to carry out biological attacks.

es with other designated laboratories during an annual UNSGM workshop. As one outcome of this process, a “curated reference genome database of high-quality that can support microbial forensic investigations and outbreak analysis” (Spiez 2023: 32) is currently being created for the UNSGM to supply investigation teams with data on pathogens that are relevant in a weapons context (Spiez 2015: 9).

Another issue that has been discussed during the Spiez workshops is the particular challenge of analysing samples when the results need to withstand political scrutiny. While laboratories normally mostly engage with the scientific community, in the context of an international investigation any results will be discussed by political actors, with possible far-reaching consequences. The use of, for instance, new automated test systems might be scientifically useful but is nevertheless not necessarily a suitable means of investigation for a UNSGM mission, because its mechanisms are a “black box” where it is difficult for outsiders to assess how the results have been obtained (Spiez 2015: 12).

Other new technological tools may be less controversial, such as using a digital chain of custody process (Spiez 2023: 30). While UNSGM workshops can collect and discuss technological developments and their use for UNSGM investigations, it remains crucial that qualified experts as well as designated laboratories are not only aware of available tools, but also of the potential pitfalls that the political environment of an UNSGM investigation might entail.

4.2 POLITICAL CONTEXT AND CHALLENGES

While the UNSGM is currently the only mechanism available to investigate the alleged use of biological weapons, it is embedded in a wider context of biological disarmament, non-proliferation and international security. It is therefore useful to look at this political context as well when considering the necessity and options to strengthen the UNSGM.

The BTWC is the core instrument to address biological weapons disarmament and non-proliferation, but, as outlined above, it lacks investigation capabilities. Therefore, over the years a number of States Parties to the BTWC have argued for linking the UNSGM more closely to the BTWC regime. There is no formal role for the UNSGM in the BTWC, and it is not mentioned in the text of the Convention. Nevertheless, as described in Chapter 2.1, it could play a useful role in supporting UNSC activities related to Articles VI or VII, or consultations under Article V.²³ However, the UNSGM has remained contentious in the BTWC framework to this day and was disputed during BTWC review conferences. Many States Parties have repeatedly expressed their support for the mechanism, and a group of “Friends of the UNSGM” have bolstered the efforts of UNODA to strengthen it, including by providing funding and organising training courses and exercises for rostered experts and laboratories (see below). Some other States Parties, mostly from the Group of Non-Aligned and Other States Parties to the BTWC (NAM), on the other hand, have long preferred to downplay the role of the UNSGM in

23 That Article V could be used to address allegations of biological weapons use is evident from Cuba’s invoking this article in 1997 to deal with its accusation that the USA had employed a biological agent against Cuba (Zilinskas 1999).

the BTWC, presumably because they saw a reinforced role of the mechanism as counteracting their objective of establishing a legally binding and holistic additional instrument to strengthen the BTWC. Finally, Russia has opposed linking the UNSGM to the BTWC more closely for many years and has submitted a UNSGM-related proposal in the framework of the UN (see below). As a result of intense deliberations at each review conference since 2006, BTWC States Parties have collectively recognised the UNSGM as an “international institutional mechanism for investigating cases of alleged use of biological or toxin weapons” and invited the UNSC “to request, if it deems necessary and in accordance with its Resolution 620 of 1988, the United Nations Secretary-General to investigate the allegation of use, using the technical guidelines and procedures contained in Annex I of United Nations Document A/44/561 [...]”.²⁴

In 2020, Russia started a UNSGM-related initiative in which it proposed a review of the UNSGM Guidelines & Procedures and a revision of the mechanism’s relationship with the BTWC and the UNSC. It has undertaken this initiative through resolutions submitted to the UNGA and its First Committee as well as through statements and a proposal submitted in the BTWC framework (UNGA 2020a: 13; UNGA 2021a; UNGA 2021b: 28–34; UNGA 2022). Regarding the review of the guidelines and procedures, Russia submitted draft resolutions to the UNGA First Committee in 2020, 2021 and 2022. These resolutions called on the UNSG to initiate a review process of the mechanism and to solicit the views of member states, and also encouraged UN members to transmit any proposals for revisions of the UNSGM to the UNSG. None of the draft resolutions was adopted.²⁵ In explaining its proposal, Russia pointed out that there had been no such revision since the mechanism was established in the 1980s and argued that updates were hence necessary in light of developments and technological changes since then. In 2023 and 2024, Russia continued to promote its proposal through statements made to the UNGA First Committee and in the BTWC framework on behalf of 13 other states (Russia 2023).²⁶ While it thus received some support for this initiative, many other countries have consistently rejected it, repeatedly arguing either that the authority to initiate revisions of the guidelines and procedures rested solely with the UNSG, or that the Guidelines & Procedures in their current state had proven to be workable and did not need any revisions at all. Some of these countries also criticised the Russian suggestion as an attempt to undermine trust in the UNSGM’s current effectiveness.²⁷

24 See Final Document of the 8th BTWC Review Conference (BWC 2017: 14, 16). The language in the 2011 and 2006 documents is identical, although in 2006 the second reference was also placed in the section on Article VI. The Final Declarations of the review conferences in 2006, 2011 and 2016 are available online (UNODA c). The 2022 Review Conference could not agree on a Final Declaration.

25 In 2020, the resolution as a whole was rejected by 67 countries, with 31 countries voting “yes” and 63 abstentions. Votes on individual paragraphs were distributed largely similarly, though at times with a slightly higher number of abstentions than negative votes. For the voting record see UNGA (2020a: 24–27). Voting results in 2021 (A/C.1/76/L.54): 31 yes - 64 no - 77 abstentions (UNGA 2021c); in 2022 (A/C.1/77/L.69): 30 yes - 65 no - 77 abstentions (UNGA 2022).

26 Statement by the Representative of the Delegation of the Russian Federation at the Thematic debate on “Other WMDs” in the First Committee of the 79th Session of the UN General Assembly, New York, 22 October 2024, https://mid.ru/en/foreign_policy/news/1977191/ (25/10/2024).

27 See explanations of vote by the United States, Germany on behalf of the EU and associated countries, Australia, the United Kingdom, Canada, Switzerland, New Zealand, Iran, and India (in the order in which they were delivered), all contained in UNGA (2020a: 14–18, 28–29).

In their section G, the Guidelines & Procedures indeed provide for the possibility of revisions initiated by the UNSG, which may take into account the views of member states in this process. A revision of the appendices was carried out in 2007, which resulted, among other things, in the inclusion of items pertaining to investigations of biological weapons use. The Guidelines & Procedures themselves are written in a generic way to be adaptable to different mission scenarios; they were applied and proved effective in the investigation of alleged chemical weapons use in Syria in 2013, as well as in the Capstone Exercise carried out in 2020 and 2022 which simulated an investigation of an alleged biological weapons attack (RKI 2023a; UNGA 2013b).

Regarding the role of the UNSC, Russia's 2020 draft resolution, while reaffirming the UNSGM as well as the BTWC, CWC and Geneva Protocol, stated that any allegation of biological weapons use should be dealt with only within the BTWC framework (UNGA 2020b). This would effectively have provided for UNSC involvement in accordance with Article VI of the BTWC, including the possibility for the five permanent UNSC members to exercise their veto powers to block an investigation. If implemented, the Russian proposal would have sidelined the UNSGM, prevented states from calling on the UNSG directly to request an investigation, and circumvented any independent investigations through this mechanism. The proposal was opposed not only by those countries who traditionally support the UNSGM strongly, but also for instance by Iran, which supported the draft resolution as a whole but voted against the paragraph that referred to the role of the UNSC. In its explanation of vote, Iran emphasised the need for independence of the UNSGM, out of concern over what it perceived as Western countries' dominance in the Security Council. Several Western countries put on record that they continued to strongly support the UNSGM as well as the pertinent international treaties, but that they had voted against the draft resolution because they opposed what they saw as a Russian attempt to undermine the mechanism's independence by enhancing the role of the UNSC (including the permanent members' veto power) in the investigation process.²⁸

The 2021 and 2022 draft resolutions lacked any reference to the role of the UNSC but focused solely on the revision of the Guidelines & Procedures. However, in 2021 and in 2022 Russia submitted working papers to the BTWC Meeting of Experts and the 9th Review Conference, respectively, in which it proposed that a group of governmental experts should develop "guidelines and procedures to initiate and conduct investigations under Article VI of the BTWC" (Russia 2021; 2022). As explained above, under this article States Parties to the BTWC can request the UNSC to deal with matters of grave compliance concerns, as the use of biological weapons would be. By establishing a parallel investigation mechanism in addition to the UNSGM under Article VI, this proposal would introduce different standards and modes of investigation and would accord the UNSC a role in the investigation of alleged bioweapons use, which would politicise the investigations, especially given the current polarisation of the UNSC over matters of international security. At the BTWC Meeting of States Parties and the First Committee of the UNGA in 2023, several states referred to the UNSGM and the

28 See explanations of vote by the United States, Germany on behalf of the EU and associated countries, Australia, the United Kingdom, Canada, Switzerland, New Zealand, Iran, and India (in the order in which they were delivered), all contained in UNGA (2020a: 14–18, 28–29). Explanations of vote on the 2021 draft resolution are contained in UNGA (2021b: 29–32). For Russian proposals in the BTWC framework see BTWC Working Papers submitted by Russia in 2021 and 2022 (Russia 2021; 2022).

Russian initiative, either by simply reaffirming their support for the UNSGM or by also rejecting the Russian proposals that the UNSGM needed a revision or that the UNSC should play any role in that mechanism.²⁹

The topic of investigations of alleged biological weapons use or of disease outbreaks of unclear origin has received limited attention from non-governmental experts. One proposal, however, put forward by the Nuclear Threat Initiative's biological programme (NTI:bio), aims to bolster international capabilities to "discern the source of high-consequence biological events of unknown origin" (Kane/Yassif 2023). To this end, NTI proposed to establish a new mechanism, the "Joint Assessment Mechanism" (JAM), that would "enable a rapid-reaction multinational team to determine the source of a high-consequence biological event of unknown origin." (Cameron et al. 2020: 21). In the view of the initiators of this proposal, the new mechanism would complement existing investigation capabilities, as it "would be more expansive and intensive than a standard WHO public health mission, and the bar for triggering it would be lower than that for a UN Secretary General's Mechanism investigation" (Cameron et al. 2020: 21), though this bar would still "be set high enough to preclude easy launch of frivolous investigations that undermine the integrity of the mechanism" (Cameron et al. 2020: 21–22). Regarding the institutional and administrative set-up, the proposal suggests that the JAM should be based in the UNSG's office and should act in cases where initial WHO investigations indicate that the source of an outbreak is unclear (NTI 2024). This proposal addresses a current gap in investigation capacities, where the origin of a disease outbreak appears unusual but where there is not sufficient evidence for a deliberate attack to warrant a UNSGM mission (NTI 2024). However, its political, institutional, financial and technical feasibility may need further discussion.

The WHO addresses investigations of disease outbreaks inter alia in its "Global framework to define and guide studies into the origins of emerging and re-emerging pathogens with epidemic and pandemic potential", published in September 2024 (WHO 2024a). The framework does not set up an international investigation mechanism. Rather, it is intended to provide guidance to states on how to investigate outbreaks of infectious diseases with epidemic and pandemic potential quickly and efficiently. While the framework includes a section on laboratory biosafety and biosecurity, it explicitly states that "the deliberate or intentional release of pathogens from laboratories is not covered in this framework" (WHO 2024a: 20). Investigations carried out in accordance with this framework would hence not cover alleged biological weapons use. However, WHO has also been developing measures and procedures to respond to deliberate biological events with a focus on the public health aspects (WHO 2024c). In such an instance, or if the origin of an outbreak is unclear, WHO investigations might well run in parallel with other national and UNSGM investigations, which should be taken into consideration when a UNSGM mission is being planned.

29 See statements submitted to the 2023 Meeting of States Parties to the BTWC (Sweden) and to the First Committee of the UNGA in October 2023 (Australia, Canada, Czechia, France, Germany, Japan, South Africa, South Korea, Spain, Switzerland, the UK, Ukraine and the United States). While most states only referred to "proposals" or "initiatives", Germany, Ukraine and the United States explicitly named Russia in their statements. All statements are available at UNODA a.

4.3 ACTIVITIES TO STRENGTHEN THE MECHANISM

The consideration of technological developments and of the political context has underlined the need to strengthen the UNSGM in its current form, including by exploiting useful technological developments, preparing for all kinds of incident and investigation scenarios, and safeguarding the mechanism against political attacks. According to its mandate, the UNSGM can be activated to investigate alleged attacks with chemical as well as biological weapons. However, unlike the BTWC, the CWC, which entered into force in 1997, contains provisions for the investigation of alleged chemical weapons use (CWC Verification Annex, Part XI), and the OPCW maintains an inspectorate that is also trained for this purpose. Any case of alleged chemical weapons use involving a CWC member state would hence primarily be dealt with by the OPCW. Even before Syria acceded to the CWC and the OPCW took over the investigations of alleged chemical use there, the UNSGM was able to draw on the expertise of the OPCW (and the WHO, for that matter) in its investigation.³⁰ With 193 States Parties as of December 2024, the CWC is by now near universal in membership. While future UNSGM investigations in the chemical field are not inconceivable, it is likely that any such investigation would be carried out by the OPCW if CWC members were involved, or at least with OPCW support as laid out in the Supplementary Agreement concluded between the UN and the OPCW. Given the lack of similar investigation procedures and institutions in the biological weapons field, no such support would be available to the UNSG to investigate cases of alleged biological weapons attacks. The focus of activities to maintain and strengthen the UNSGM's capacities has hence been on the biological field.

Without a standing capacity similar to the OPCW, biological investigations will depend on qualified experts who are ready to be deployed in case the UNSGM is activated. Experts can have such diverse backgrounds as "medicine, veterinary medicine, plant health, microbiology, chemistry, toxicology, and epidemiology" (G&P, Appendix IV). Apart from those disciplines listed in the Guidelines & Procedures, other areas of expertise have been identified as crucial, such as having security experts in the team (UNODA 2015: 10). Ake Sellström, head of the UNSGM mission in Syria, has commented on his experience that the "multidisciplinary demands of contemporary inspections" should be considered "by continuously cultivating new expertise in fields such as chemistry, biology, forensics, and criminal investigation" (Sellström 2021: 99). Moreover, during the most recent comprehensive exercise (see below), it became clear that a mission could benefit from additionally strengthening certain skills sets on the roster, and that member states should be encouraged to nominate, for instance, more experts on interviewing, communication, media analysis etc. (RKI 2023a).

For such a diverse team to be able to deploy to the field on short notice and to carry out an effective investigation, sufficient training is indispensable. UNODA takes a central role in coordinating efforts to strengthen the capacities of the mechanism. In the interest of promoting an objective investigation, UNODA has taken steps to geographically diversify the roster of expert consultants, qualified experts and laboratories. However, recent numbers demonstrate that there is still an imbalance, with WEOG (Western European and Others Group) representation outnumbering other regions, especially in contrast to the GRULAC (Group of Latin American and Caribbean Countries) (UNODA d). In order

30 Since toxins are also covered by the CWC, this would extend to the alleged use of toxins as weapons as well.

to address this issue, UNODA has recently focused more on outreach activities for the African, Asian and Latin American regions.³¹ As the responsibility to nominate experts for the roster lies with the Member States, it is important to continue those efforts and raise awareness that a diverse skill set is needed for the complex task of a biological weapons investigation.

Besides the UN as a coordinating body, training and capacity-building rests largely on the shoulders of Member States willing to support the UNSGM. This "Friends of the UNSGM" group consists of like-minded states that provide in-kind contributions in the form of funding, equipment, suggestions for policies/procedures, and training. Regarding training, the Guidelines & Procedures note that

(a)ny interested Member State may designate to the Secretary-General relevant specialized training or courses available to qualified experts in support of their possible role on his behalf in carrying out investigations of possible use of CBT [chemical, biological or toxin, UJ/SK/IM] agents including exchange of information and expertise, in order to facilitate achievement of a common basis of understanding and operation. (G&P, para. 40)

There has been a range of training courses since 2009, organized or hosted by various states including Australia, Canada, Denmark, France, Germany, Portugal, Sweden, South Africa, the UK and the United States. INTERPOL, VERTIC and the OPCW have also provided training for qualified experts in the past (UNODA e). In addition, several other countries and the European Union have provided financial contributions inter alia for training efforts, and other support.³²

With each potential mission representing a unique case with individual requirements, experts need to be equipped with a set of skills covering aspects such as knowledge of the UNSGM Guidelines & Procedures, familiarity with UN regulations, security awareness, interview and sampling, negotiation and communication, etc. Training has focused on building and enhancing those mission-relevant skills and at the same time providing the opportunity for team building amongst the qualified experts on the roster. Also, expert consultants have been more involved in recent years, such as in an expert consultant workshop in 2020.³³ While expert consultants will have extensive technical expertise in their respective fields, they also need to have a good level of understanding of the UNSGM, its mandate and procedures. With more than 600 qualified experts and more than 120 expert consultants currently on the roster, the need to train each of them is also far from covered. Fluctuation on the roster has put an additional strain on training efforts, impeding the goal to prepare all rostered experts for a mission. UNODA has recently created a training catalogue to ensure consistency, which foresees that all qualified experts participate in a UNSGM "basic training course" as well as an SSAFE (Safe and Secure Approaches in Field Environments) course (UNODA e). Additional training is provided for smaller numbers of experts on topics such as interviewing, biological crime

31 For activities see e.g. the UNSGM newsletter published online at <https://disarmament.unoda.org/wmd/unsgm-newsletter/>.

32 <https://disarmament.unoda.org/wmd/sgm-partners/>.

33 <https://disarmament.unoda.org/wmd/sgm-training-activities/>.

scene management, safe handling and shipment of samples, and decontamination (UNODA e). There have also been collaborative workshops with both expert consultants and qualified experts, such as a pre-deployment workshop held by UNODA in 2024.³⁴ Still, it will require continuous engagement of Member States to provide the funding for future training courses.

The results of past training efforts and the general preparedness situation of the UNSGM have been tested in two field exercises organized by Germany. The first Capstone Exercise in 2014 was based on the what was called a “functional subunit approach”, which had been proposed by Denmark and entailed small teams from different countries that had previously worked together covering specific tasks within the investigation (RKI 2023b). This approach was discarded as not feasible, and for the second exercise in 2020/2022, the head of mission together with a core team was responsible for building subunits ad hoc from the selected team members. The second Capstone Exercise focused on evaluating the cooperation of different stakeholders involved in a mission and the current status of training of qualified experts. The resulting evaluation report identified various lessons learned which have encouraged the *Friends of the UNSGM* group and UNODA to work on a more consistent training approach customised to the needs of qualified experts.

Any future UNSGM mission would have to face complex political conditions and expectations as well as the challenges and opportunities posed by technological developments. All this should be taken into account when considering relevant fields of expertise for rostered experts and enhancing training opportunities. The potential for disinformation and misinformation has increased in the digital age, which consequently requires experts to be prepared to navigate and communicate this highly challenging terrain. Similarly, any results presented by the mission team in their report will need to withstand scrutiny by political, scientific and possibly legal stakeholders that may or may not try to delegitimize the work of the mission team (Mc Leish/Moon 2020: 540). Experiences from investigations of chemical weapons use in Syria show how findings from even independent and technically sound investigations can become highly politicised and contested. Training therefore will need to raise awareness amongst qualified experts for these political challenges and, ideally, also prepare them sufficiently for the task of navigating a politically sensitive situation.

5. CONCLUSIONS AND RECOMMENDATIONS

This PRIF Report has summarized the main political, scientific and technological challenges for the UNSGM as well as the current discussions around addressing them. In view of the nature of the field, it is important to keep in mind that the UNSGM has a specific mandate to investigate allegations of the use of biological or chemical weapons. The UNSGM would be neither mandated nor equipped to carry out a standard epidemiological investigation, which would fall to national or international public health authorities and institutions, or to conduct a criminal investigation, which would be the task of law enforcement agencies. In practice, however, there might be overlaps and intersections between

34 <https://front.un-arm.org/wp-content/uploads/2024/06/UNSGM-issue8.pdf>,
<https://publications.unoda.org/documents/5/UNSGM-issue9.pdf> (22/10/2024).

these kinds of investigations in the event of a disease outbreak of ambiguous origin. It would therefore be important for all stakeholders potentially involved to be aware of each others' mandates, activities, objectives and frameworks of investigations in order to minimise friction and use synergies between the different processes to the greatest extent possible.

As described in the text, the field of biological weapons poses inherent challenges given the difficulty in distinguishing between natural disease outbreaks, accidental releases and deliberate attacks. The risk of disease outbreaks with epidemic or pandemic potential is expected to increase,³⁵ and combined with rising international tensions that already include bioweapons-related aspects, this also increases the need for independent and effective investigation capacities. Technological developments in biology, biotechnology and other fields such as artificial intelligence may enhance the threat of bioweapons, as some of them could potentially be misused for weapons purposes; however, they also provide opportunities to enhance prevention, detection, mitigation and not least investigation of disease outbreaks, regardless of their origin. Politically, there are a number of challenges. Changing modes of warfare could perhaps change rationales for including biological weapons in military or terrorist strategies. A growing risk of misuse stemming from biological research with dual-use potential may, among other things, give rise to misperceptions and suspicions in case of disease outbreaks with unclear origins. Bioweapons-related disinformation campaigns, building on the fact that much of biological research and biotechnology has a dual-use character, are already being carried out and could increase. And last but not least, there are political efforts underway to undermine the independence of UNSGM investigations and, more generally, the trust in scientific expertise related to arms control and disarmament investigations.

There is thus an important role for independent, effective and credible investigations of allegations of biological weapons use such as the UNSGM could provide. A UNSGM investigation can help clarify such allegations by either confirming or refuting them, thereby addressing situations that could easily exacerbate international tensions. It could contribute to deterring violations of the non-use norm for biological weapons, and while it is not an instrument of enforcement or accountability itself, it could at least indirectly and under certain circumstances contribute to holding perpetrators accountable for the use of biological weapons.

The leeway for interested states to pursue avenues in traditional arms control strategies is currently limited and may decrease even further in the future. The negotiation of new multilateral arms control instruments is likely to remain difficult for the time being in the current international security climate. It is hence crucial to maintain, support and strengthen the existing instruments. The UNSGM is operational, and one of its strengths is its independence from the political quarrels and veto powers in the UNSC. Maintaining this independence and safeguarding it against efforts to undermine it will be a crucial task for the future. Ensuring the UNSGM's operationality and effectiveness in light of the scientific, technological and political challenges outlined above is also of the essence.

35 The increase in disease outbreaks with epidemic or pandemic potential is influenced by several factors, including climate change and globalisation, zoonotic transmission, viral mutation and antimicrobial resistance (see e.g. Edelson et al. 2023; RKI 2023c; Semenza et al. 2022).

There are three types of stakeholders that can in one way or another provide specific support to ensure that the UNSGM remains actionable and strong in its capabilities to uphold the norm of biological non-use. First, the UNSGM is dependent on UN Member States, who should not only call upon its opportunities for investigation in a case of alleged use of biological weapons, but also provide the means to ensure that the rostered experts and laboratories are sufficiently trained and prepared. UN Member States should therefore contribute sustainable funding and other forms of material support to UNODA in order to support training efforts that are strategic and sustainable. UN Member States' commitment is also crucial to strengthening the UNSGM politically. The importance of this mechanism is well known to many within the international disarmament community. However, there is a need to spread awareness about the UNSGM further, also at the national level, regarding the opportunities and procedures of the mechanism's investigations. Awareness-raising efforts should be directed towards those who have the authority to nominate experts and laboratories as well as those who would come into contact with a UNSGM mission professionally, for example through concurrent public health or law enforcement investigations. In addition, while some UN Member States such as the *Group of Friends of the UNSGM* are highly invested in supporting the mechanism and have nominated many experts to the roster, it is important that all geographic regions be well represented in order to ensure that an investigation would be accepted politically. Political representatives should therefore share their knowledge about the mechanism and promote further nominations from under-represented UN Member States.

Second, UNODA as custodian of the mechanism is the main resource in ensuring the preparedness of the UNSGM. UNODA is already very engaged in strengthening the capacities for an investigation, and should continue to promote the UNSGM to ensure the availability of a broad geographical and professional range of expertise, provide training for rostered experts and laboratories, and carry out exercises to test internal procedures and different scenarios with which a real mission could be faced. UNODA is not only the coordinating entity for an investigation mission, but would also consult and work together with other potential parallel investigations such as those by national and international health bodies as well as national law enforcement. It is hence crucial to develop plans for such scenarios and for UNODA to continue to engage in discussions with relevant institutions such as WHO, WOH, OPCW and INTERPOL.

Finally, the disarmament research community plays a role in enhancing knowledge about the mechanism. This PRIF Report is intended to contribute to the scarce literature that currently exists to raise awareness and to inform research on international bioweapons investigations. Further research could be conducted, for instance, to examine and evaluate potential opportunities and risks of new technological and political developments for the UNSGM; to identify, analyse and assess the political and technical developments that affect the UNSGM in its capacity to act; and to develop policy options designed to strengthen the UNSGM in the face of the challenges it is facing. Taken together, action by all three stakeholder groups could ensure that the UNSGM can provide a viable and usable instrument to help achieve the goal as set out in the BWC preamble, "for the sake of all [human]kind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons".

All sources were last checked on 15 December 2024.

- Appelt, Sandra et al. 2021: Strengthening the United Nations Secretary-General's Mechanism to an Alleged Use of Bioweapons Through a Quality-Assured Laboratory Response, in: *Nature Communications* 12, 3078, <https://doi.org/10.1038/s41467-021-23296-5>.
- Ayers, John W./Chu, Brian/Zhu, Zechariah/Leas, Eric C/Smith, Davey M/Dredze, Mark/Broniatowski, David A 2021: Spread of Misinformation About Face Masks and COVID-19 by Automated Software on Facebook, in: *JAMA Intern Med.* 181: 9, 1251–1253.
- Bentley, Michelle 2023: *The Biological Weapons Taboo*, Oxford.
- Bioweapons Disinformation Monitor 2022: Allegations Against the US and Ukraine (Brief No 2 of 6, September 2022), https://static1.squarespace.com/static/63051204dbf49630ab7f3edc/t/635e3b4eed5eab36eb79cceb/1667119950525/N2_Bioweapns_disinformation_Ukraine_V4.pdf.
- Bonotti, Matteo/Zech, Steven T. 2021: The Human, Economic, Social, and Political Costs of COVID-19, in: Bonotti, Matteo/Zech, Steven T. (eds.) 2021: *Recovering Civility during COVID-19*, Singapore, 1–36.
- Borrett, Veronica et al. 2020: Science and Technology for WMD Compliance Monitoring and Investigations, WMD Compliance and Enforcement Series No. 11, Geneva: UNIDIR, <https://doi.org/10.37559/WMD/20/WMDCE11>.
- BWC (Biological Weapons Convention) 2017: Final Document of the Eighth Review Conference (BTWC/CONF.VIII/4, Geneva), 11 January, [https://unoda-documents-library.s3.amazonaws.com/Biological_Weapons_Convention_-_Eighth_Review_Conference_Eighth_session_\(2016\)/BWCCONF.VIII4%2BEnglish%2B.pdf](https://unoda-documents-library.s3.amazonaws.com/Biological_Weapons_Convention_-_Eighth_Review_Conference_Eighth_session_(2016)/BWCCONF.VIII4%2BEnglish%2B.pdf).
- Cameron, Beth/Yassif, Jaime/Jordan, Jacob/Eckles, Jacob 2020: Preventing Global Catastrophic Biological Risks. Lessons and Recommendations from a Tabletop Exercise held at the 2020 Munich Security Conference. NTI, https://media.nti.org/documents/NTI_BIO_TTX_RPT_FINAL.pdf.
- Carus, W. Seth 2017: A Century of Biological Weapons Programs (1915–2015): Reviewing the Evidence, in: *The Nonproliferation Review* 24: 1–2, 129–153.
- Edelson, Paul J./Harold, Rachel/Ackelsberg, Joel/Duchin, Jeffrey S./Lawrence, Steven J./Manabe, Yukari C./Zahn, Matt/LaRoque, Regina C. 2023: Climate Change and the Epidemiology of Infectious Diseases in the United States, *Clinical Infectious Diseases* 76: 5, 950–956, <https://doi.org/10.1093/cid/ciac697>.
- Espona, Maria J. 2024: Voluntary Transparency Initiatives: The Case of Peer Review Exercises in the Context of the BWC, Geneva: UNIDIR, <https://doi.org/10.37559/WMD/24/CBW/02>.
- Flade, Florian 2018: The June 2018 Cologne Ricin Plot: A New Threshold in Jihadi Bio Terror, in: *CTC Sentinel* 11: 7, 1–4, <https://ctc.westpoint.edu/wp-content/uploads/2019/01/CTC-SENTINEL-082018-final.pdf>.
- Gera, Prachi/Gupta, Ankit/Verma, Priyanka/Singh, Joginder/Gupta, Jeena 2017: Recent Advances in Vaccine Development Against Ebola Threat as Bioweapon, in: *Virusdisease* 28: 3, 242–246. DOI: 10.1007/s13337-017-0398-0.
- Goose, Stephen D. 1987: Armed Conflict in 1986, and the Iraq-Iran War, in: *SIPRI Yearbook 1987*, Oxford, 297–320.

- Harris, Elisa 2020: North Korea and Biological Weapons: Assessing the Evidence, Policy Paper, The Henry L. Stimson Center, November 6, 2020, <https://www.stimson.org/2020/north-korea-and-biological-weapons-assessing-the-evidence/>.
- Hart, John 2014: Chemical and Biological Weapon Programmes, in: SIPRI Yearbook 2014, Oxford, 398–402.
- Himmel, Mirko/Frey, Stefan 2022: SARS-CoV-2: International Investigation Under the WHO or BWC, in: *Frontiers in Public Health*, 3 February 2022, <https://doi.org/10.3389/fpubh.2021.636679>.
- Henckaerts, Jean-Marie/Doswald-Beck, Louise 2005: Customary International Humanitarian Law, International Committee of the Red Cross, Cambridge: Cambridge University Press.
- Ilchmann, Kai/Revill, James 2014: Chemical and Biological Weapons in the “New Wars”, in: *Science and Engineering Ethics* 20: 3, 753–767.
- Jakob, Una 2024: Instrumentalising Biological Weapons-Related Allegations: Russia’s Compliance Politics and the Norms Against Biological Weapons, CBWNet Working Paper No. 15, https://cbwnet.org/media/pages/publications/working-paper/instrumentalising-biological-weapons-related-allegations-russia-s-compliance-politics-and-the-norms-against-biological-weapons/0a35044526-1732882541/2024_1129-instrumentalising-biological-weapons-related-allegations-1.pdf.
- Jakob, Una/Jeremias, Gunnar/Kelle, Alexander/Marauhn, Thilo/Meier, Oliver/Nixdorff, Kathryn/Trapp, Ralf/de Vries, Barry 2022: Russian Allegations of Biological Weapons Activities in Ukraine (PRIF Blog), 22 March, <https://blog.prif.org/2022/03/22/russian-allegations-of-biological-weapons-activities-in-ukraine/>.
- Jakob, Una 2020: Die Covid-19-Pandemie: Schlaglicht auf das Spannungsfeld von Biowaffenkontrolle, Biosicherheit und globaler Gesundheit, in: *Zeitschrift für Friedens- und Konfliktforschung*
- Kane, Angela/Yassif, Jamie 2023: OK, But Where Will the Next Pandemic Come From?, in: *The Hill*, 17 March, <https://thehill.com/opinion/healthcare/3905161-ok-but-where-will-the-next-pandemic-come-from/>.
- Knight, Dacre 2021: COVID-19 Pandemic Origins: Bioweapons and the History of Laboratory Leaks, in: *South Med J.* 114: 8, 465–467. DOI: 10.14423/SMJ.0000000000001283.
- Koch, Lionel/Lopes, Anne-Aurelie/Maiguy, Avelina/Guillier, Sophie/Guillier, Laurent/Tournier, Jean-Nicolas/Biot, Fabrice 2020: Natural Outbreaks and Bioterrorism: How to Deal with the Two Sides of the Same Coin? in *Journal of Global Health* 10: 2, 020317. DOI: 10.7189/jogh.10.020317.
- Krin, Anna/Jeremias, Gunnar 2023: Artificial Intelligence: Possible Risks and Benefits for BWC and CWC, CBWNet Working Paper No. 5, July 2023, CBWNet, <https://cbwnet.org/media/pages/publications/working-paper/artificial-intelligence-possible-risks-and-benefits-for-bwc-and-cwc/ff-95cdf423-1702984262/wp-5-website-version.pdf>.
- Leitenberg, Milton 2021: False Allegations of Biological Weapons Use from Putin’s Russia, in: *The Nonproliferation Review* 27: 4, 425–442.
- Lentzos, Filippa/Littlewood, Jez 2022: Don’t Let Finger-Pointing Doom this Key Treaty Against Bioweapons, in: *Bulletin of the Atomic Scientists*, 4 March, <https://thebulletin.org/2022/03/dont-let-finger-pointing-doom-this-key-treaty-against-bioweapons/>.

- Littlewood, Jez 2006: Investigating Allegations of CBW Use: Reviving the UN Secretary-General's Mechanism (Compliance Chronicles: Research from the Canadian Centre for Treaty Compliance, No. 03), December.
- Littlewood, Jez/Lentzos, Filippa 2022: Russia's Alleged Bioweapons Claims Have Few Supporters, in: Bulletin of the Atomic Scientists, 11 October, <https://thebulletin.org/2022/10/russias-alleged-bio-weapons-claims-have-few-supporters/#post-heading>.
- Lundin; S.J. 1989: Chemical and Biological Weapons: Developments in 1988, in: SIPRI Yearbook 1989, Oxford, 99–130.
- Lundin, S.J./Robinson, Julian P./Trapp, Ralf 1988: Chemical and Biological Warfare: Developments in 1987, in: SIPRI Yearbook 1988, Oxford, 101–125.
- Makdisi, Karim/Pison Hindawi, Coralie 2017: The Syrian Chemical Weapons Disarmament Process in Context. Narratives of Coercion, Consent, and Everything In Between, in: Third World Quarterly 38: 8, 1691–1709.
- Mc Leish, Caitríona/Moon, Joshua R. 2020: Sitting on the Boundary: The Role of Reports in Investigations Into Alleged Biological-Weapons Use, in: The Nonproliferation Review 27: 4–6, 525–540.
- NTI 2024: White Paper: The Joint Assessment Mechanism. Discerning the Source of High-Consequence Biological Events of Unknown Origin, https://www.nti.org/wp-content/uploads/2021/10/Joint-Assessment-Mechanism-White-Paper_No-Watermark.pdf.
- Petersen, Robert 2022: Fear and Loathing in Moscow: The Russian Biological Weapons Program in 2022, in: Bulletin of the Atomic Scientists, 5 October 2022, <https://thebulletin.org/2022/10/the-russian-biological-weapons-program-in-2022/>.
- Reis, Kadri 2024a: Technological Implications of AI in Biorisk, in: Daase, Christopher/Goettsche, Malte (eds.): CNTR Monitor 2024 – Perspectives on Dual Use, Frankfurt/Main: PRIF, <https://monitor.cntrarmscontrol.org/en/2024/technological-implications-of-ai-in-biorisk/>.
- Reis, Kadri 2024b: Implications of Technological Advancements for Biosecurity, in: Daase, Christopher/Goettsche, Malte (eds.): CNTR Monitor 2024 – Perspectives on Dual Use, Frankfurt/Main: PRIF, <https://monitor.cntrarmscontrol.org/en/2024/implications-of-technological-advancements-for-biosecurity/>.
- RKI (Robert Koch Institute) 2023a: Evaluation of the Capstone Exercise 2020/2022. Executive Report, https://www.rki.de/EN/Content/infections/biological/projects/UNSGM/capstone_exercise.pdf?__blob=publicationFile.
- RKI 2023b: UNSGM Project. Exercise on the “Functional Subunit” Approach 2014, https://rki.de/EN/Content/infections/biological/projects/UNSGM/UNSGM_node.html#Start.
- RKI 2023c: Impact of Climate Change in Infectious Diseases and Antimicrobial Resistance – Part 1 of the German Status Report on Climate Change and Health 2023. Journal of Health Monitoring S 3, June 2023, https://www.rki.de/EN/Content/Health_Monitoring/Health_Reporting/GBEDownloadsJ/JHealthMonit_2023_S3_Status_report_climate_change_health_part1.pdf?__blob=publicationFile.
- Robinson, Julian P. 1985: Chemical and Biological Warfare: Developments in 1984, in: SIPRI Yearbook 1985, Oxford, 159–217.

- Robinson, Julian P./Guillemin, Jeanne/Meselson, Matthew 1987: Yellow Rain: The Story Collapses, in: *Foreign Policy* 68, 100–117.
- Russia 2021: Strengthening the Biological Weapons Convention (BWC). Proposal for the BWC Article VI Implementation (BWC/MSP/2020/ WP.2, Geneva), 15 November 2021, <https://documents.un.org/doc/undoc/gen/g21/326/37/pdf/g2132637.pdf>.
- Russia 2022: Strengthening the Biological Weapons Convention (BWC): Proposal for the BWC Article VI Implementation (BWC/CONF.IX/WP.15, Geneva) 7 November, <https://documents.un.org/doc/undoc/gen/g22/579/57/pdf/g2257957.pdf>.
- Russia 2023: Joint Statement in Support of the Efforts to Strengthen the United Nations Secretary-General's Mechanism for Investigation of the Alleged Use of Chemical and Biological Weapons (BWC/MSP/2023/WP.20/Rev.1, Geneva), 14 December, <https://documents.un.org/doc/undoc/gen/g23/261/77/pdf/g2326177.pdf>.
- Sellström, Ake 2021: Lessons from Weapons Inspections in Iraq and Syria, *AJIL Unbound* 115, 95–99. DOI: 10.1017/aju.2021.5.
- Semenza, Jan C./Rocklöv, Joacim/Ebi, Kristie L. 2022: Climate Change and Cascading Risks from Infectious Disease, *Infectious Diseases and Therapy* 11, 1371–1390, <https://doi.org/10.1007/s40121-022-00647-3>.
- Spiez Laboratory 2015: UNSGM Designated Laboratories Workshop Report, 9–11 November 2015, <https://backend.spiezlab.admin.ch/fileservice/sdweb-docs-prod-spiezlab-files/files/2024/05/24/4c6bfe7f-4b42-469a-889b-5bc81164ca6f.pdf>.
- Stock, Thomas 1993: Chemical and Biological Weapons: Developments and Proliferation, in: *SIPRI Yearbook* 1993, Oxford, 259–292.
- Trapp, Ralf 2014: Elimination of the Chemical Weapons Stockpile of Syria, in: *Journal of Conflict & Security Law* 19: 1, 7–23.
- Trapp, Ralf 2023: Chemical and Microbiological Forensics in Investigations of Alleged Uses of Chemical and Biological Weapons – a Preliminary Analysis (CBWNET, Working Paper No. 04, February 2023), https://cbwnet.org/media/pages/publications/working-paper/chemical-and-microbiological-forensics/ea2a53e0f3-1676557423/2023-0216_wp-4_trapp-forensics_web.pdf.
- UN Digital Library 1980: Chemical and Bacteriological (Biological) Weapons: Resolution/Adopted by the General Assembly (Voting Data), <https://digitallibrary.un.org/record/629625?ln=en>.
- UN Digital Library 1982: Provisional Procedures to Uphold the Authority of the 1925 Geneva Protocol: Resolution/Adopted by the General Assembly (Voting Data), <https://digitallibrary.un.org/record/621706?ln=en>.
- UN Digital Library 1987: Chemical and Bacteriological (Biological) Weapons: Measures to Uphold the Authority of the 1925 Geneva Protocol and to Support the Conclusion of a Chemical Weapons Convention: Resolution/Adopted by the General Assembly (Voting Data), <https://digitallibrary.un.org/record/281173?ln=en>.
- UN Digital Library 1990: Chemical and Bacteriological Weapons: 1925 Geneva Protocol (Voting Data), <https://digitallibrary.un.org/record/282219?ln=en>.

- UNGA (UN General Assembly) 1982: Report of the Group of Experts to Investigate Reports on the Alleged Use of Chemical Weapons (A/37/259), 1 December, <https://documents.un.org/doc/undoc/gen/n82/343/02/pdf/n8234302.pdf>.
- UNGA 1989: Chemical and Bacteriological (Biological) Weapons. Report of the Secretary-General (A/44/561), 04 October, <https://documents.un.org/doc/undoc/gen/n89/234/36/pdf/n8923436.pdf>.
- UNGA 1990: Chemical and Bacteriological (Biological) Weapons. Measure to Uphold the Authority of the 1925 Geneva Protocol (A/RES/45/57C), 04 December, <https://digitallibrary.un.org/record/192894?v=pdf>.
- UNGA 2006: The United Nations Global Counter-Terrorism Strategy (A/RES/60/288), 20 September, <https://documents.un.org/doc/undoc/gen/n05/504/88/pdf/n0550488.pdf?OpenElement>.
- UNGA 2020a: General Assembly Official Records (75th Session. 1st Committee, 12th Meeting), (A/C.1/75/PV.12), 04 November, <https://documents.un.org/doc/undoc/gen/n20/298/58/pdf/n2029858.pdf>.
- UNGA 2020b: Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons. Revised Draft Resolution/China, Nicaragua, Russian Federation and Venezuela (A/C.1/75/L.65/Rev.1), 22 October, <https://documents.un.org/doc/undoc/ltd/n20/283/57/pdf/n2028357.pdf>.
- UNGA 2021a: Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons: Draft Resolution/Nicaragua, Russian Federation and Zimbabwe (A/C.1/76/L.54), 14 October, <https://documents.un.org/doc/undoc/ltd/n21/289/57/pdf/n2128957.pdf>.
- UNGA 2021b: General Assembly Official Records (76th session. 1st Committee, 17th Meeting), (A/C.1/76/PV.17), 03 November, <https://documents.un.org/doc/undoc/gen/n21/318/80/pdf/n2131880.pdf>.
- UNGA 2021c: First Committee List of draft proposals for the 76th session, https://www.un.org/en/ga/first/76/pdf/FC_List_draft_proposals_76_Voting_Results.pdf.
- UNGA 2022: Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons: Draft Resolution/Belarus, China, Nicaragua, Russian Federation and Venezuela (A/C.1/77/L.69), 13 October, <https://documents.un.org/doc/undoc/ltd/n22/631/95/pdf/n2263195.pdf>.
- UNGA/Security Council 2013a: Report of the United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian Arab Republic on the Alleged Use of Chemical Weapons in the Ghouta Area of Damascus on 21 August 2013 (A/67/997–S/2013/553), 16 September; <https://digitallibrary.un.org/record/756814?v=pdf>.
- UNGA/Security Council 2013b: United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian Arab Republic. Final Report (A/68/663–S/2013/735), 13 September, <https://documents.un.org/doc/undoc/gen/n13/617/84/pdf/n1361784.pdf?OpenElement>.
- UN News 2023: WHO Urges China to be 'Transparent' in Sharing COVID-19 Data, 17 March, <https://news.un.org/en/story/2023/03/1134727>.

- UNOCT (UN Office of Counter-Terrorism) 2017: Ensuring Effective Interagency Interoperability and Coordinated Communication in Case of Chemical and/or Biological Attacks, https://www.un.org/sites/www.un.org.counterterrorism/files/uncct_ctitf_wmd_wg_project_publication_final.pdf.
- UNODA (UN Office for Disarmament Affairs) a: Biological Weapons Convention – Meeting of States Parties (2023), <https://meetings.unoda.org/meeting/67446/documents>.
- UNODA b: Confidence Building Measures, <https://disarmament.unoda.org/biological-weapons/confidence-building-measures>.
- UNODA c: Meetings Place, <https://meetings.unoda.org/>.
- UNODA d: Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM), <https://disarmament.unoda.org/wmd/secretary-general-mechanism>.
- UNODA e: Training Activities in Support of the Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM), <https://disarmament.unoda.org/wmd/sgm-training-activities/>.
- UNODA 2013: Frequently Asked Questions about the United Nations Mission to Investigate the Allegations of the Use of Chemical Weapons in the Syrian Arab Republic, 20 September, https://front.un-arm.org/wp-content/uploads/2013/09/FAQ_Syria_CW_updated_20092013.pdf.
- UNODA 2015: The Secretary-General's Mechanism for Investigation of Alleged Use of Chemical, Bacteriological (Biological) or Toxin Weapons. A Lessons-learned Exercise for the United Nations Mission in the Syrian Arab Republic, May 2015, <https://front.un-arm.org/wp-content/uploads/assets/publications/more/syrian-ll-report/syrian-ll-report-2015.pdf>.
- UNODA 2024: Fact Sheet. The Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons, July 2024, <https://front.un-arm.org/wp-content/uploads/2024/07/SGM-Fact-Sheet-July2024-002.pdf>.
- UN Security Council 2004: Resolution 1540 (2004) (S/RES/1540), 28 April, <https://documents.un.org/doc/undoc/gen/n04/328/43/pdf/n0432843.pdf>.
- UN Security Council 1540 Committee: Security Council Resolutions, <https://www.un.org/en/sc/1540/resolutions-committee-reports-and-SC-briefings/security-council-resolutions.shtml>.
- Wheelis, Mark/Rósz, Lajos/Dando, Malcolm 2006: Deadly Cultures: Biological Weapons Since 1945, Harvard: Harvard University Press.
- WHO (World Health Organization) 2024a: WHO Global Framework to Define and Guide Studies into the Origins of Emerging and Re-Emerging Pathogens with Epidemic and Pandemic Potential (Geneva, 04 September), https://cdn.who.int/media/docs/default-source/documents/epp/sago/who_sago_global-framework.pdf?sfvrsn=47325c91_2&download=true.
- WHO 2024b: COVID-19 Dashboard. Number of COVID-19 Deaths Reported to WHO, <https://data.who.int/dashboards/covid19/deaths>.
- WHO 2024c: Deliberate Events, <https://www.who.int/news-room/fact-sheets/detail/deliberate-events>.
- Zanders, Jean Pascal 2023: The Biological and Toxin Weapons Convention Confronting False Allegations and Disinformation, Non-Proliferation and Disarmament Papers No. 85, EU Non-Proliferation and Disarmament Consortium, October 2023, https://www.nonproliferation.eu/wp-content/uploads/2023/10/EUNPDC_no-85.pdf.

Zilinskas, Raymond 1999: Cuban Allegations of Biological Warfare by the United States: Assessing the Evidence, *Critical Reviews in Microbiology* 25: 3, 173–227, <https://doi.org/10.1080/10408419991299202>.

Zmorzynska, Anna/Jeremias, Gunnar 2012: Managing Technology Transfers under the Biological and Toxin Weapons Convention, *Non-Proliferation Papers No. 21*, EU Non-Proliferation Consortium, September 2012, <https://www.nonproliferation.eu/wp-content/uploads/2018/10/annazmorzynskaandgunnarjeremias5059df061f3b2.pdf>.

PRIF REPORT

PRIF Reports offer background analyses on political events and developments and present research findings.

Gubsch, Martin (2025): Making Projects Work. Conflict and Participatory Processes in Wind Park Construction in La Guajira, Colombia, PRIF Report 1/2025, Frankfurt/M. DOI: 10.48809/prifrep2501

Natal, Ariadne; Kreuzer, Peter (2024): Violent Mandates: Presidential Power, Institutional Failure, and the Rise of Police Killings in Brazil and the Philippines, PRIF Report 6/2024, Frankfurt/M. DOI: 10.48809/prifrep2406.



<https://www.prif.org/prif-reports>

PRIF SPOTLIGHT

PRIF Spotlights discuss current political and social issues.

Hach, Sascha; Polianskii, Mikhail (2024): Reducing Nuclear Threats: Why Talks on Ending the War in Ukraine Should Include Agreements on Nuclear Risk Reduction, PRIF Spotlight 12/2024, Frankfurt/M. DOI: 10.48809/prifspot2412.

Jakobi, Anja P.; Herbst Lena (2024): Between a Rock and a Hard Place. The UN Cybercrime Convention, PRIF Spotlight 11/2024, Frankfurt/M. DOI: 10.48809/prifspot2411.



<https://www.prif.org/prif-spotlights>

PRIF BLOG

PRIF Blog presents articles on current political issues and debates that are relevant for peace and conflict research.



<https://blog.prif.org/>

PRIF Reports and PRIF Spotlights are open-access publications and are available for download at www.prif.org. If you wish to receive our publications via email or in print, please contact publikationen@prif.org.

 <https://social.bund.de/@PRIF>

 <https://bsky.app/profile/prif.org>

 <https://www.linkedin.com/company/peace-research-institute-frankfurt>

INVESTIGATION OF ALLEGED USE OF BIOLOGICAL WEAPONS – STRENGTHENING THE UN SECRETARY-GENERAL’S MECHANISM

Una Jakob // Stefan Kloth // Ines Mergler

The use of biological weapons is universally prohibited. Even mere allegations that such weapons had been used can have grave consequences on international security, global health, and societal peace. Such allegations therefore need to be investigated independently and in a scientifically sound manner. Currently, the only available international mechanism to do so is the *UN Secretary-General’s Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons* (UNSGM). In this PRIF Report, the authors describe the UNSGM and outline current challenges and possible avenues to strengthen it.

Dr. Una Jakob is a Senior Researcher and Head of PRIF’s Research Group Biological and Chemical Disarmament and Security. Dr. Stefan Kloth is a research associate at the Centre for International Health Protection at the Robert Koch Institute, where he leads a project dedicated to strengthening the UNSGM through targeted trainings and practical exercises. Ines Mergler is a research associate at the Centre for International Health Protection of the Robert Koch Institute and holds a position in a project to strengthen the UNSGM.