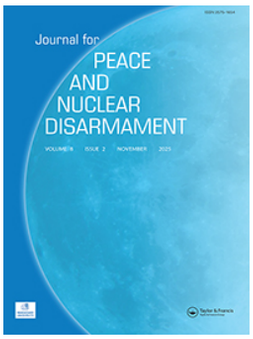

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The Scientific Advisory Group for the Treaty on the Prohibition of Nuclear Weapons and Its Statement on the 80th Anniversary of the Nuclear Weapon Era

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ABSTRACT

In 2022, the first Meeting of States Parties of the United Nations Treaty on the Prohibition of Nuclear Weapons (TPNW) agreed to establish a Scientific Advisory Group. This commentary by the co-chairs of the Scientific Advisory Group introduces the treaty and the establishment, mandate, and activities of the Group, notes some of its key recommendations and its work to build a broader TPNW Scientific Network. The commentary includes the Group's most recent public action: a statement to mark the 80th anniversary of the first production, test, use, and threat of use of nuclear weapons. In this statement, the Group connected these events to the core prohibitions of the TPNW, recalled a tradition of efforts by scientists to warn of nuclear weapons dangers and called for scientists to take individual and collective action to end the nuclear weapons era.

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Introduction

On 6 August 2025, the Scientific Advisory Group of the United Nations Treaty on the Prohibition of Nuclear Weapons (TPNW) issued a statement to mark the 80th anniversary of the first production, test, use, and threat of use of nuclear weapons. The Group's statement connected these historical events in July and August 1945 to the core prohibitions of the TPNW. It also reflected on and supported efforts by scientists over many decades, including before July 1945, to warn of nuclear weapons dangers and the imperative to end them.

Aimed especially at the scientific and wider academic communities, who identify themselves through their specialized knowledge and expert practices, the Scientific Advisory Group statement highlighted that scientists have a special responsibility in regard to the nuclear weapons era and for being a part of urgent action to bring about its close, including through individual and collective action.

This commentary by the co-chairs of the Scientific Advisory Group introduces the TPNW and the establishment, mandate, and activities of the Group. It includes the full text of the Group's *Statement on the 80th anniversary of the development, use, and threat of use of nuclear weapons.*

The TPNW

The Treaty on the Prohibition of Nuclear Weapons (TPNW) was negotiated in 2017 at the United Nations and the text agreed by 122 countries.[1] The negotiations were mandated by United Nations General Assembly resolution 71/258 – "Taking forward multilateral nuclear disarmament negotiations" – adopted on 23 December 2016, that "Decides to convene in 2017 a United Nations conference to negotiate a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination".[2] The TPNW opened

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[1]United Nations conference to negotiate a legally-binding instrument to prohibit nuclear weapons: Second session A/CONF.229/2017/L.3/Rev.1, Draft treaty on the prohibition of nuclear weapons, 7 July 2017, https://s3.amazonaws.com/unoda-web/wp-content/uploads/2017/07/A.Conf_.229.2017.L.3.Rev_.1.pdf.

[2]UN General Assembly, Resolution A/RES/71/258 "Taking forward multilateral nuclear disarmament negotiations", adopted 23 December 2016, https://docs.un.org/en/A/RES/71/258.

for signature in September 2017 and entered into force on 22 January 2021. As of September 2025, 94 states are TPNW signatories and 73 have already ratified it.[3]

The Treaty is the first legally binding international agreement that comprehensively prohibits nuclear weapons. It is motivated in particular by the catastrophic humanitarian consequences of the use of these weapons for human health, the local and regional environment, and long term, global consequences, which will include impacts on innocent bystander populations in societies not a party to any conflict (ICRC 2025). The prohibitions on the development, testing, possession, stationing, threat of use, and use of these weapons under the treaty are tied to these consequences.

The TPNW shares the rationale and approach underlying the 1972 Biological and Toxin Weapons Convention (BWC) and the 1991 Chemical Weapons Convention (CWC) and that prohibit biological weapons and chemical weapons respectively. [4] Drawing on these counterparts, and the Comprehensive Test Ban Treaty (CTBT) that universally prohibits nuclear weapons tests, along with treaties outlawing land-mines and cluster munitions,[5] the TPNW aims at the global elimination of nuclear weapons.

As part of a complex regime of treaties intended to achieve nuclear disarmament, the TPNW is widely recognised as an important step in the fulfilment of the 1968 nuclear Non-Proliferation Treaty (NPT). Article VI of this treaty requires that "*Each of the Parties to the Treaty* undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control" (emphasis added).[6] With the TPNW, its signatories and states-parties have taken a step to fulfilling their NPT Article 6 obligation.

The TPNW Scientific Advisory Group

The TPNW is the first nuclear weapons treaty under which parties decided to establish a scientific advisory group to provide treaty members and observers with access to rigorous scientific and technical analysis to support its implementation.

The CWC has a long-established Scientific Advisory Board which as provided significant advice and support to governments – particularly important for those countries which do not have easy access to this type of specialist knowledge – and helps create a common basis for unscientific understanding and charting the way forward.[7] There is no analogous body for the Biological and Toxin Weapons Convention.

The proposal for a TPNW Scientific Advisory Group was first made by a group of researchers at Princeton University's Program on Science and Global Security in 2019 (Patton, Philippe, and Mian 2019). The Scientific Advisory Group (SAG) was established at the first Meeting of States Parties (1MSP) in Vienna in 2022.[8] This decision was based on a working paper "Institutionalizing scientific and technical advice for the effective implementation of the Treaty on the Prohibition of Nuclear Weapons" prepared by the President-designate of the meeting. The working paper proposed the Group be mandated to "inform States Parties about developments in scientific and technical fields relevant to the Treaty, including the implementation of article 4 of the treaty, humanitarian consequences and risks associated with nuclear weapons and nuclear disarmament and non-proliferation more widely".[9]

Specifically, the SAG is charged with the following responsibilities:

(a) Reporting to the Meeting of States Parties and Review Conference about developments in scientific and technical fields relevant to the Treaty, its goals, objectives and implementation;

[3]UN Office of Disarmament Affairs Treaties Database, https://treaties.unoda.org/t/tpnw/participants.
[4]The Chemical Weapons Convention https://www.opcw.org/chemical-weapons-convention.; the Biological Weapons Convention https://treaties.unoda.org/t/bwc.
[5]The AP Mine Ban Convention https://www.apminebanconvention.org/en/the-convention/history-and-text; the Convention on Cluster Munitions https://www.clusterconvention.org/convention-text/.
[6]The Non-Proliferation Treaty, https://www.un.org/en/conf/npt/2005/npttreaty.html.
[7]The CWC Scientific Advisory Board, https://www.opcw.org/sites/default/files/documents/CSP/C-II/en/C-II_DEC.10_Rev.1-EN.pdf.
[8]*Report of the first Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons*, TPNW/MSP/2022/6, 21 July 2022, https://docs.un.org/en/TPNW/MSP/2022/6.
[9]*Institutionalizing scientific and technical advice for the effective implementation of the Treaty on the Prohibition of Nuclear Weapons*, Working Paper prepared by the President-designate of the first Meeting of States Parties (1MSP), TPNW/MSP/2022/WP.6, 17 June 2022, https://digitallibrary.un.org/record/3977754/files/TPNW_MSP_2022_WP.6-EN.pdf.

(b) Supporting capacity-building in States parties, including through scientific and technical engagement with scientists, academia and civil society organizations, including individuals from communities affected by nuclear weapons, about the technical issues related to Treaty implementation, the humanitarian consequences and risks associated with nuclear weapons and the related humanitarian response challenges;
(c) Upon request by the States parties or upon recommendation by the Group, provide scientific and technical advice on matters related to the Treaty and nuclear disarmament and non-proliferation more widely, as well as on the humanitarian consequences of and risks associated with nuclear weapons and related humanitarian response challenges to States parties, to the President and subsidiary bodies established by Meetings of States Parties;
(d) When directed by the Meeting of States Parties or Review Conference, provide advice and make recommendations to be considered at Meetings of States Parties or Review Conferences, taking account of any relevant scientific and technical developments for the purpose of assisting in the review of the operation of the Treaty;
(e) When directed by the Meeting of States Parties or Review Conference, assess and report on the scientific and technical merit of a present, or proposed, approach or methodology for implementation of the Treaty;
(f) Coordinate the efforts of specialist scientific or technical working groups temporarily established in accordance with its rules of procedure.

The SAG was formally constituted in February 2023 and is composed of 15 experts nominated by states-parties. This followed an open nomination process to ensure a wide range of scientific and technical expertise, such as nuclear physics/engineering, verification technologies, meteorology, public health and environmental sciences, with participation reflecting gender balance and equitable geographical distribution. Members are from government, academia, international organisations, and civil society and serve in their individual capacities – a list of members is given in the acknowledgements section.[10]

The SAG 2023 Reports

In October 2023, at the second Meeting of States Parties (2MSP) of the TPNW, SAG submitted two reports. There was a report of the Scientific Advisory Group on its annual activities.[11] There also was the substantive report of the Scientific Advisory Group on the status and developments regarding nuclear weapons, nuclear weapon risks, the humanitarian consequences of nuclear weapons, nuclear disarmament and related issues.[12]

One of the recommendations in the 2023 substantive report was for TPNW states to seek a UN General Assembly mandating an independent international scientific study on the climatic, environmental, physical and social effects in the weeks to decades following nuclear war. The most recent previous UN study was published in 1989.[13]

The idea of a twenty-first-century UN study of nuclear war was first proposed a decade ago (Mian 2024). In its 2023 recommendation, SAG proposed that such a study could focus on the impacts on current local, national, regional and global socioeconomic and political systems, supply chains, health care, food and energy systems and natural ecosystems. The study could also analyse whether and how the interactions of these different physical, environmental and social effects over various timescales might lead to cascading humanitarian consequences.

The proposal was taken forward by states parties to the TPNW into the UN General Assembly in 2024 under the resolution "Nuclear war effects and scientific research", (A/C.1/79/L.39) and adopted with only

[10]Membership of the Scientific Advisory Group, https://meetings.unoda.org/-/treaty-on-the-prohibition-of-nuclear-weapons-scientific-advisory-group-2023 and https://www.icanw.org/tpnw_scientific_advisory_group.
[11]Report of the Scientific Advisory Group on its annual activities 2023, https://docs.un.org/en/TPNW/MSP/2023/6.
[12]Report of the Scientific Advisory Group on the status and developments regarding nuclear weapons, nuclear weapon risks, the humanitarian consequences of nuclear weapons, nuclear disarmament and related issues, TPNW/MSP/2023/8, 27 October 2023, https://front.un-arm.org/publications/tpnw-sag-report.pdf.
[13]Study on the Climatic and Other Global Effects of Nuclear War (United Nations publication, 1989), https://digitallibrary.un.org/record/39166?ln=en&v=pdf.

three countries opposing (France, the Russian Federation and the United Kingdom).[14] The 21-member panel was established in July 2025 and will report in 2027.

The SAG 2025 Reports

In March 2025, at the third Meeting of States Parties (3MSP) of the TPNW, SAG submitted two reports. One was its mandatory report on its annual activities.[15] The other was a working paper 'Update to the 2023 Report of the Scientific Advisory Group on the status and developments regarding nuclear weapons, nuclear weapon risks, the humanitarian consequences of nuclear weapons, nuclear disarmament and related issues.[16]

In the 2025 working paper, SAG made several findings and recommendations (Mian and Kütt 2025). SAG proposed that TPNW States parties could commission research into the risks of inadvertent nuclear use and its relationship to nuclear war preparedness exercises and how to mitigate such risks. The States parties could also consider proposals for greater transparency and notification requirements in respect of military nuclear exercises, possible limits on such exercises and a call for a moratorium on nuclear weapon-related military exercises in times and regions of crisis involving nuclear-armed States.

SAG recommended also that TPNW States parties should develop, both within their national scientific communities and collectively, the capability to conduct peer reviews and national, regional and global consequence modelling of all aspects of the effects of nuclear weapons for the purpose of improving national and global nuclear weapons risk analysis. States parties should encourage their respective scientific communities to collaborate and work together to understand better the full extent of the long-term contamination and resulting public health and environmental impacts of radioactive fallout from nuclear weapons testing. SAG drew attention in particular to the value of the TPNW states parties mobilizing their scientific communities to assist the Pacific island state of Kiribati, the site of over 30 nuclear weapon test explosions by the United Kingdom and the United States. The IAEA has done radiological studies at other test sites (some were over 20 years ago and have not been updated), making it a potential candidate to conduct a study of conditions on Kiribati and a possible monitoring programme.

Other recommendations addressed disarmament measures and verification.

The next public reports by the Scientific Advisory Group will be to the First Review Conference of the TPNW, scheduled for 30 November to 4 December 2026 at the United Nations in New York.

The TPNW Scientific Network and Outreach

As part of the SAG's support to States Parties, the Group has set out to identify and engage scientific and technical experts and institutions to establish a geographically diverse and gender-balanced network of experts to support the goals of the Treaty. In 2024, a pilot network was set up to help develop and test the tools of engagement and management for the network. There are currently 24 members of the pilot scientific network, from a wide range of countries with a diverse expertise. SAG will expand this network to include more scientific and technical experts with the aim of increasing the scientific support for the implementation and goals of the TPNW.

SAG regularly invites researchers from the wider academic research community to brief the SAG and to engage and share research projects, developments and findings. During 2MSP and 3MSP, SAG with help from the International Campaign to Abolish Nuclear Weapons (ICAN), the Group met a diverse group of academic researchers to discuss key TPNW issues and share ideas and suggestions for research and cooperation. At 3MSP, SAG also met with representatives of several communities harmed by the Hiroshima and Nagasaki bombs, and by nuclear testing and by other aspects of nuclear weapon programs, including uranium mining.

[14]Nuclear war effects and scientific research, A/C.1/79/L.39, https://docs.un.org/en/A/C.1/79/L.39.
[15]Report of the Scientific Advisory Group on its annual activities 2025, https://docs.un.org/en/TPNW/MSP/2025/8.
[16]Update to the 2023 report of the Scientific Advisory Group on the status and developments regarding nuclear weapons, nuclear weapon risks, the humanitarian consequences of nuclear weapons, nuclear disarmament and related issues : 3rd Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons : working paper/submitted by the Scientific Advisory Group, TPNW_MSP_2025_WP.5-EN.pdf, 21 February 2025, https://digitallibrary.un.org/record/4077298?ln=en&v=pdf.

Scientific Advisory Group for the Treaty on the Prohibition of Nuclear Weapons Statement on the 80th Anniversary of the Development, Use, and Threat of Use of Nuclear Weapons

As the Scientific Advisory Group for the Treaty on the Prohibition of Nuclear Weapons (TPNW), we make this statement to mark the 80th anniversary of the development, testing, use, and threat of use of nuclear weapons. All these actions were taken first by the United States and opened a terrible and fearful era in the shared global history of humanity.

We recall the secret US Manhattan Project that built the first nuclear weapons, the Trinity test that created the first nuclear explosion and unleashed nuclear fallout, the bombing of Hiroshima that devastated a city, and President Harry Truman's subsequent threat of "a rain of ruin from the air, the like of which has never been seen on this earth". They brought suffering, death, and despair, and cast the terrible shadow of nuclear war over the future. But there also was hope.

We also mark here the 80th anniversary of the June 1945 "Report of the Committee on Political and Social Problems" by a group of Manhattan Project scientists. Chaired by Nobel Laureate James Franck, the Report is a milestone in the global efforts by scientists to understand and warn of the humanitarian consequences and other impacts of nuclear weapons and the imperative of disarmament as the path to avert them.

The Franck Report emphasised that the bomb was an "indiscriminate method of wholesale destruction of civilian life" and "a grave danger for the safety of this country as well as for the future of all the other nations". It warned both of a future "nuclear armament race" and the risk of "conversion of a peace time nucleonics industry to military production" (proliferation). It urged "an agreement permitting an effective international control of the means of nuclear warfare".[17]

Over the eight decades of the nuclear weapons age since then, some scientists have continued to design, build and maintain nuclear weapons, others have sought to control and eliminate these weapons. Scientists have contributed to key ideas for many of the international agreements aiming to limit nuclear dangers. These include treaties restricting nuclear weapons testing, curtailing the further spread of nuclear weapons, capping the number and types of nuclear weapons, and most recently the TPNW.

The TPNW is another source of hope for ending the nuclear age. Agreed in 2017 by 122 states at the United Nations, it entered into force in 2021 when 50 states had joined the treaty. As of August 2025, almost half of the members of the United Nations are signatories. The Treaty has a comprehensive set of obligations, including undertakings to "never under any circumstances" develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons. States with nuclear weapon programs are required to eliminate them.

But the work of lifting the nuclear shadow is not done. In fact, humanity today faces a renewed and growing danger from the nuclear arsenals and policies of the nine nuclear armed states and their allies. Nuclear weapons treaties have failed to enter into force, not been complied with or have been rejected altogether. The nine nuclear-armed states have been modernising and, in some cases, increasing their arsenals and relying more on making nuclear threats. There is renewed debate in some countries on allowing the stationing of weapons on their territory or acquiring nuclear weapons of their own.

With humanity facing a renewed and increasing risk of nuclear war, scientists individually and together must once again take action. To this end, we call on scientists to ask themselves and their professional organizations what ethical and practical responsibilities do scientists bear for ending the nuclear danger to the well-being of humankind and the planet.

The Scientific Advisory Group recalls and supports the "Atomic Scientists' Appeal to Colleagues" made in 1995 in Hiroshima on the 50th anniversary of the bomb, by physics Nobel Laureate Hans Bethe, who was the director of the Theoretical Division of Los Alamos Laboratory during the Manhattan Project, together with other Manhattan Project scientists, for 'all scientists in all countries to cease and desist from work creating, developing, improving and manufacturing further nuclear weapons".[18] The Appeal noted that while states will decide their national nuclear weapon policies "individual scientists can still influence this process by withholding their skills".

[17]Report of the Committee on Political and Social Problems, Manhattan Project "Metallurgical Laboratory", University of Chicago, June 11, 1945 (The Franck Report), https://www.dannen.com/decision/franck.html.

[18]The "Atomic Scientists Appeal" was released at the Pugwash Conference in Hiroshima on July 25, 1995; "Atomic Scientists Appeal to Colleagues: Stop Work on Further Nuclear Weapons", *Journal of the Federation of American Scientists*, Volume 48, No. 5 September/October 1995, https://prop1.org/2000/fas1.htm.

The Scientific Advisory Group also believes scientists, the public and decision makers worldwide need a deeper understanding of the full range of destructive impacts of nuclear weapons. We welcome the establishment in 2025 by the United Nations General Assembly of an Independent Scientific Panel on the Effects of Nuclear War.

The creation of this panel was a key recommendation in our 2023 report to the meeting of the states-parties of the TPNW. We call on scientists in all states to contribute their knowledge and expertise to the Panel and to circulate the Panel's report widely and to take action on its recommendations.

The Scientific Advisory Group also calls on all scientists in all countries to lend their expertise and support to the scientific and technical efforts for furthering nuclear disarmament, arms control, and non-proliferation. They can for instance contribute by laying the scientific and technical basis for national and international policies and decisions: to improve the understanding of impacts of nuclear war on societies and environments; to meet the needs of victims of nuclear weapons testing and use, and other activities in the production and maintenance of nuclear weapons, by addressing legacy contamination and environmental remediation of areas harmed by nuclear weapon testing and production; and to develop methods and tools for verifying irreversible nuclear disarmament. Scientists also can work to educate each other, especially the next generation, and the public and policy makers on the risks posed by nuclear weapons arsenals and policies; and expand the role of science for disarmament, conflict resolution and peace and as a bridge between states and societies globally.

The existence of nuclear weapons is too great a risk for humanity and our planet. Science should aim to preserve our shared planet and build a safer and more peaceful world and not serve to destroy it. It is our time to act.

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References

ICRC (International Committee of the Red Cross). 2025. "Hiroshima 80 Years On: The Humanitarian Imperative to Eliminate Nuclear Weapons," International Committee of the Red Cross. https://www.icrc.org/en/article/hiroshima-80-years-humanitarian-imperative-eliminate-nuclear-weapons.

Mian, Z. 2024. "Nuclear War Effects and Scientific Research: Time for a 21st Century UN Study." *First Committee Monitor* 22 (1). October 4, 2024, Reaching Critical Will, New York.

Mian, Z., and M. Kütt. 2025. "Key Findings and Recommendations from the TPNW Scientific Advisory Group 3MSP Working Paper." *Nuclear Ban Daily* 5 (1) February 2025. https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/nuclear-weapon-ban/3msp/reports/nbd5.1.pdf.

Patton, T., S. Philippe, and Z. Mian. 2019. "Fit for Purpose: An Evolutionary Strategy for the Implementation and Verification of the Treaty on the Prohibition of Nuclear Weapons." *Journal for Peace & Nuclear Disarmament* 2 (2): 387–409. https://doi.org/10.1080/25751654.2019.1666699.