

EFFECTIVE AND COMPREHENSIVE CBRN SECURITY RISK MANAGEMENT IN THE 21ST CENTURY

TATYANA NOVOSSIOLOVA AND MAURIZIO MARTELLINI*

I. INTRODUCTION

Countering the proliferation and use of chemical, biological and nuclear weapons—collectively known as weapons (and materials) of mass destruction (WMD)—is a priority of utmost importance to maintaining international peace and stability in the 21st century. The end of the cold war coupled with the intense processes of ongoing globalization have created new opportunities for international cooperation, engagement and exchange. But they have also created conditions that give rise to novel security challenges, which threaten to undermine the coherence of the international WMD non-proliferation and disarmament regimes. Critical underlying factors for this trend include the changing nature of armed conflict, the rapid progress of science and technology, and the growing global diffusion of capabilities with multiple adaptive uses.¹ The multifaceted nature of novel security concerns related to WMD knowledge and materials calls for broadening

¹ For further discussion on this point, see Meselson, M., 'Averting the hostile exploitation of biotechnology', *CBW Conventions Bulletin*, vol. 48 (June 2000); Perry Robinson, J. P., 'Difficulties facing the Chemical Weapons Convention', *International Affairs*, vol. 84, no. 2 (Mar. 2008); Koblentz, G. D., 'Biosecurity reconsidered: Calibrating biological threats and responses', *International Security*, vol. 34, no. 4 (2010); Hoffman, B., 'The World Trade Center bombing, the Three Mile Island intrusion and the potential threat to US nuclear power plants', Congressional Testimony CT-106, Mar. 1993; Daly, S., Parachini, J. and Rosenau, W., *Aum Shinrikyo, Al Qaeda, and the Kinshasa Reactor: Implications of Three Case Studies for Combating Nuclear Terrorism* (RAND Corporation: 2005); and Kuperman, A. J. (ed.), *Nuclear Terrorism and Global Security: The Challenge of Phasing out Highly Enriched Uranium* (Routledge: 2015).

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SUMMARY

The multifaceted nature of security concerns related to the proliferation of weapons of mass destruction (WMD) in the 21st century requires a novel organizing principle for the international multilateral efforts focusing on the prevention of the hostile misuse of chemical, biological, radiological and nuclear (CBRN) knowledge and materials. At the heart of this security paradigm is the need for strengthening the established international norms against the development, spread and use of WMD, and ensuring the comprehensive in-depth implementation of relevant regulatory instruments through the internalization of safety and security practices, procedures and behaviours among relevant professional communities. This paper argues that effective CBRN security risk management requires the integration of national, regional and international strategic approaches that promote and uphold the norms of WMD non-proliferation and disarmament.

ABOUT THE AUTHORS

Dr Tatyana Novossiolova (Bulgaria) is a Research Fellow in the Law Program at the Center for the Study of Democracy, Bulgaria. She has developed an interactive biological security training manual that has been translated into several different languages.

Prof. Maurizio Martellini (Italy) is Director of the Insubria Center on International Security, Secretary General of the Landau Network-Fondazione Alessandro Volta, Associate Professor of Physics at the University of Insubria, Italy, and a member of the Italian Union of Scientists for Disarmament. He is also an advisor to the Italian Ministry of Foreign Affairs. Martellini is an expert in non-proliferation and disarmament and CBRN cyber issues.

Table 1. Key instruments of relevance to the international weapons of mass destruction (WMD) non-proliferation and disarmament regimes

Non-proliferation and disarmament agreements	International instruments for countering WMD terrorism	Export and import control arrangements
1925 Geneva Protocol	United Nations Security Council Resolution 1373	Zangger Committee
Biological and Toxin Weapons Convention (BWC)	UN Security Council Resolution 1540 UN Global Counter-Terrorism Strategy	Nuclear Suppliers Group (NSG)
Chemical Weapons Convention (CWC)	International Convention on the Suppression of Terrorist Bombings	Wassenaar Arrangement (WA)
Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT)	Convention on the Suppression of Unlawful Acts Relating to International Civil Aviation	Missile Technology Control Regime (MTCR)
Treaty on the Prohibition of Nuclear Weapons (TPNW)	Convention on the Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment	Green Customs Initiative (GCI) ^a
Outer Space Treaty	International Convention for the Suppression of Acts of Nuclear Terrorism	
Comprehensive Nuclear-Test-Ban Treaty (CTBT)	Code of Conduct on the Safety and Security of Radioactive Sources	
Hague Code of Conduct against Ballistic Missiles Proliferation (HCOC)		

^a This is not an export control regime, but an arrangement focused on strengthening border controls to prevent the illicit trade in certain commodities, including toxic chemicals and living modified organisms.

Source: Authors' compilation.

the traditional disarmament and non-proliferation approaches, in order to enhance their flexibility and adaptability. A fundamental element of this process is the emergence of a chemical, biological, radiological and nuclear (CBRN) security paradigm that seeks to strengthen the prevention of and response to CBRN events, regardless of their origins.² This includes effective prevention and countering of the deliberate misuse of CBRN knowledge and materials.

The 'European Union Terrorism Situation and Trend Report 2019', published by Europol, notes that three incidents involving CBRN materials were reported in European Union (EU) member states in 2018: 'Online discussions of planning CBRN attacks increased in 2018. As in previous years, intentions to use CBRN materials were expressed mainly by jihadists. Closed forums were used to propose possible *modi operandi*, share instructions to produce and disperse various agents and to identify high-profile targets.'³ The report further observes that 'the barrier

for gaining knowledge on the use of CBRN weapons has decreased', that 'Dual-use equipment and materials . . . are easily accessible', and that 'the procurement of biological toxins . . . through online and underground marketplaces continued to be a trend'.⁴ The 2020 edition of the report notes that, while no terrorist incidents involving CBRN materials were reported by EU member states in 2019, 'attacks using CBRN materials continued to be discussed and encouraged online, and knowledge continued to be exchanged via closed online forums, sometimes benefiting non-terrorist criminals'.⁵

This paper argues that addressing the wide spectrum of CBRN security concerns that the EU faces requires an integrated, multilayered approach, underpinned by the active engagement of all relevant sectors: for example, defence, law enforcement, intelligence, civil protection, health, research and innovation, and business. To ensure effective and coordinated multi-stakeholder engagement across public and private domains, it is vital to promote and embed the norms of WMD disarmament and non-proliferation

² Martellini, M. et al., 'A reflection on the future of the CBRN security paradigm', eds M. Martellini and A. Malizia, *Cyber and Chemical, Biological, Radiological, Nuclear, Explosives Challenges: Threats and Counter Efforts* (Springer: 2017). The CBRN paradigm refers both to nuclear and radiological risks and highlights the importance of preventing the hostile misuse of radioactive materials.

³ Europol, *EU Terrorism Situation and Trend Report 2019* (European Union Agency for Law Enforcement Cooperation: The Hague, 27 June

2019), p. 20.

⁴ Europol (note 3), p. 20.

⁵ Europol, *EU Terrorism Situation and Trend Report 2020* (European Union Agency for Law Enforcement Cooperation: The Hague, 23 June 2020), p. 20.

in the everyday practice of relevant professional communities. To elucidate the latter point, the paper begins with an overview of the international regulatory context of WMD non-proliferation and disarmament and examines how CBRN security risks are framed at EU level. The paper then outlines a set of key prerequisites for facilitating and enhancing cross-sectorial stakeholder interaction at national and international level, in order to strengthen CBRN security risk management. The paper concludes by analysing the ways in which the existing EU mechanisms in the area of CBRN security governance could be leveraged to facilitate cross-sectorial cooperation that further promotes the norms of WMD disarmament and non-proliferation.

II. THE EVOLUTION OF THE CBRN SECURITY PARADIGM

The international efforts to prevent and counter WMD span three interrelated frameworks: (a) multilateral non-proliferation and disarmament agreements; (b) international instruments for countering WMD terrorism; and (c) WMD-relevant export and import control arrangements (see table 1).

Multilateral non-proliferation and disarmament agreements codify the international norms on the prohibition of biological, toxin and chemical weapons, and the non-proliferation (and prohibition) of nuclear weapons. The international instruments for countering WMD terrorism address the risk that non-state actors may acquire WMD capability. The underlying assumption is that the existing regulations and measures in the field of international counterterrorism are relevant to the prevention of WMD terrorism. Equally, the full and effective implementation of relevant multilateral disarmament and non-proliferation agreements contributes to reducing the risk that non-state actors may acquire WMD. WMD-relevant export and import control arrangements seek to ensure that international trade does not contribute to the development of chemical, biological and nuclear weapons. The 1972 Biological and Toxin Weapons Convention (BWC), the 1993 Chemical Weapons Convention (CWC) and the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT) contain provisions that prohibit states parties from providing assistance in developing biological, toxin, chemical and nuclear weapons, including through the transfer of such weapons or their means of delivery from one state

to another.⁶ United Nations Security Council Resolution 1540, which seeks to prevent the acquisition and use of WMD by non-state actors, requires that all states adopt appropriate domestic export and import controls to curb the proliferation of WMD.⁷

At the heart of the BWC, the CWC and the NPT is the need to ensure that relevant advances in science and technology and related materials and equipment are used only for peaceful purposes. All three agreements contain provisions for guaranteeing access to technology and equipment so that all states can benefit to the fullest possible extent from the opportunities provided for socio-economic and political development. Upholding the norms against WMD proliferation thus requires that the benefits offered by the progress in science and innovation are reconciled with the risks that materials, technology or information may be misused to cause harm. In other words, states need to develop capacities that enable and promote the safe, secure and responsible use of CBRN materials and related information.

It is essential that the implementation of CBRN safety policies, regulations and measures, which aim to prevent the unintentional release of CBRN materials, is systematically integrated with the efforts to prevent the deliberate misuse of CBRN materials and knowledge (see figure 1). CBRN safety instruments cover domains such as occupational safety, waste management, transport and transfer safety, and accident management. Preventing the deliberate misuse of CBRN materials and information includes physical security, information security, combating illicit trafficking, governance of dual-use research, counterterrorism, civil protection and defence.

The International Atomic Energy Agency (IAEA), which oversees the implementation of the NPT, seeks to promote a strong and sustainable global nuclear safety and security framework among its member

⁶ See Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (Biological and Toxin Weapons Convention, BTWC), opened for signature 10 Apr. 1972, entered into force 26 Mar. 1975, British Foreign and Commonwealth Office, Treaty Series no. 11 (1976); Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention, CWC), United Nations Treaty Collection; and Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT), opened for signature 1 July 1968, entered into force 5 Mar. 1970, International Atomic Energy Agency, INF/CIRC/140, 22 Apr. 1970.

⁷ See UN Security Council Resolution 1540, 28 Apr. 2004.

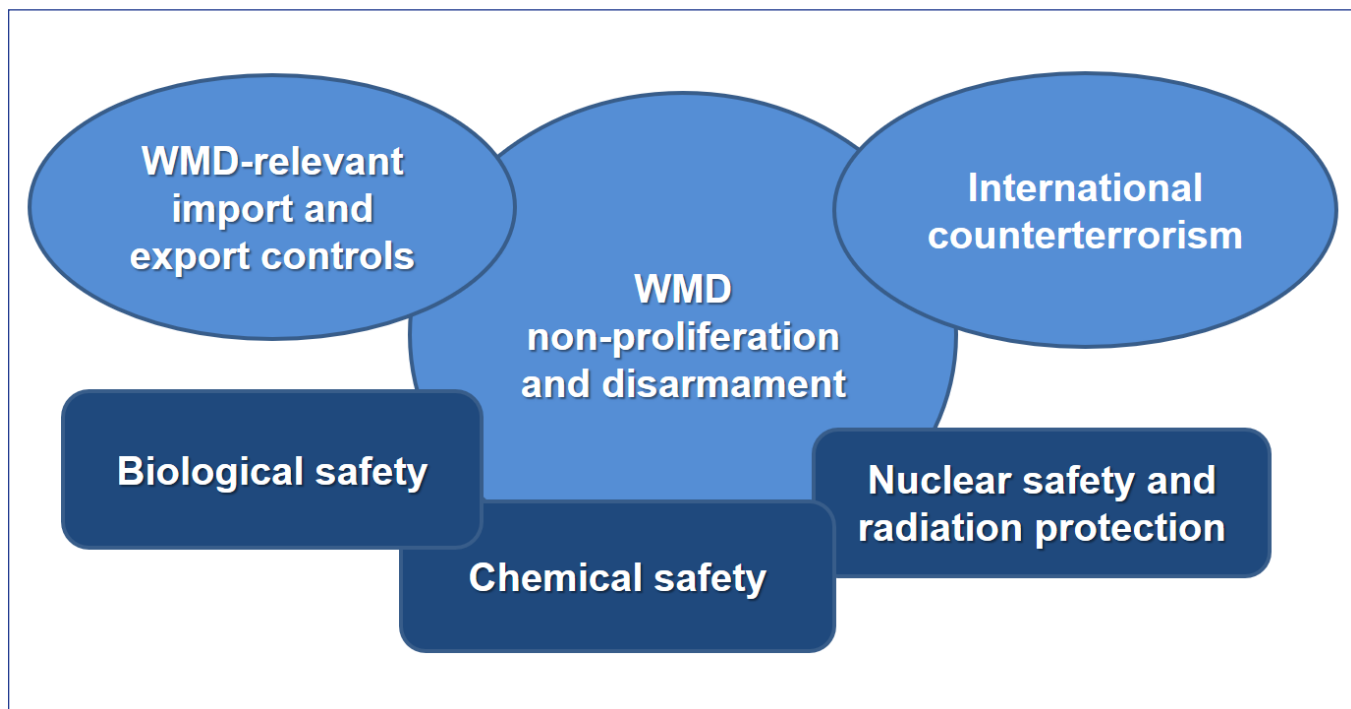


Figure 1. An integrated model of chemical, biological, radiological and nuclear security

WMD = weapon(s) of mass destruction

Source: Authors' compilation.

states.⁸ The international regime on nuclear safety focuses on the prevention and management of the risk of the unintentional release of and exposure to ionizing radiation that may result, for example, from a nuclear accident caused by a technical failure, human error or natural disaster; or from the inappropriate handling, transport or transfer of nuclear or radioactive material, including waste. To better respond to member states' priorities as regards the implementation of nuclear security, since 2002 the IAEA has adopted 3-year nuclear security plans.⁹ The areas covered by 'Nuclear Security Plan 2018–2021' include security of nuclear materials and associated facilities, including transport security; security of radioactive materials; information security and cyber security; nuclear forensics for detection and response of nuclear events; and international cooperation.¹⁰

In order to prevent the re-emergence of chemical weapons and guarantee the peaceful use of chemicals, the Organisation for the Prohibition of Chemical Weapons (OPCW)—the implementing body of the CWC—recognizes the need for strengthening

chemical safety and security in states parties.¹¹ The safe management of toxic chemicals throughout their entire life cycle is an essential element of the effective implementation of the CWC.¹² The OPCW portfolio entails an array of activities that aim at strengthening chemical security and preventing the misuse of toxic chemicals for hostile purposes. These include the systematic review of developments in science and technology with relevance to the CWC, promoting capacity building, fostering education and awareness of chemical security, and industry engagement.

The complementary role of biosafety and biosecurity in preventing the misuse of life sciences has been

¹¹ OPCW, Report of the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, RC-3/3*, 19 Apr. 2013; and OPCW, 'Capacity building: Chemical Safety and Security Management Programme', [n.d.].

¹² Relevant chemical safety international frameworks include the Stockholm Convention on Persistent Organic Pollutants, adopted on 22 May 2001, entered into force on 17 May 2004; the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, adopted on 10 Sep. 1998, entered into force 24 Feb. 2004; United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labelling of Chemicals, adopted Dec. 2002, published 2003; and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted on 22 Mar. 1989.

⁸ IAEA, 'Nuclear safety and security', [n.d.].

⁹ IAEA, 'Nuclear security plan' [n.d.].

¹⁰ IAEA, 'Nuclear Security Plan 2018–2021', GC(61)/24, 14 Sep. 2017.

recognized by the states parties to the BWC.¹³ Key areas in the biosafety domain that are relevant to strengthening the BWC include one health security and food safety; safe handling of biological agents and toxins; and biodiversity preservation, including the control of living modified organisms.¹⁴ The current BWC Intersessional Programme 2018–2020, comprising annual meetings of experts and meetings of states parties, addresses five thematic areas that underscore the interconnectedness between biosafety and biosecurity: (a) cooperation and assistance that facilitate the peaceful use of life sciences; (b) review of developments in science and technology of relevance to the BWC; (c) strengthening national implementation; (d) preparedness, response and assistance in case of an alleged use of biological weapons; and (e) institutional strengthening of the BWC.¹⁵

III. CBRN SECURITY RISKS WITHIN THE EU POLICY DISCOURSE

This section examines how CBRN security risks are framed within the EU policy discourse. The EU has given considerable attention to the risk that non-state actors may acquire and use WMD or carry out an attack involving CBRN materials. More recently, risks related to the hostile misuse of CBRN materials and knowledge are also addressed in conjunction to the need for preventing and countering hybrid threats. The EU actively supports the activities of the IAEA and the OPCW, as well as the implementation of the BWC. The EU CBRN Centres of Excellence advance an all-hazard approach to CBRN risk mitigation, which includes preventing, detecting, preparing for and responding to the deliberate misuse of CBRN materials and knowledge.¹⁶

¹³ Eighth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Final Document of the Eighth Review Conference, BTWC/CONF.VIII/4, 7 Jan. 2017.

¹⁴ Novosiolova, T. et al., 'Strengthening the Biological and Toxin Weapons Convention: The vital importance of a web of prevention for effective biosafety and biosecurity in the 21st century', Nov. 2019.

¹⁵ Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Report of the Meeting of States Parties, BWC/MSP/2017/6, 19 Dec. 2017.

¹⁶ European Union, 'EU Chemical, Biological, Radiological and Nuclear Risk Mitigation Centres of Excellence (CoE)', [n.d.].

CBRN security for effective counterterrorism

In 2001, when considering the implications of the terrorist threat for EU policy, the Council of the EU noted that:

Non-proliferation, disarmament and arms control remain an indispensable element of cooperative security between States. They can also make an essential contribution in the global fight against terrorism by reducing the risk of non-state actors gaining access to weapons of mass destruction, radioactive materials and means of delivery . . . Furthermore, multilateral instruments and regimes for disarmament, arms control and non-proliferation as well as national initiatives enforcing this goal foster confidence between States and enhance security. They thereby contribute to the building and strengthening of the international coalition against terrorism.¹⁷

In this regard, the Council underlined the value of four mutually reinforcing elements: (a) universalization and effective implementation of multilateral instruments in the area of non-proliferation, disarmament and arms control; (b) strengthening export controls to prevent terrorist groups and states that harbour them from acquiring materials relative to WMD; (c) promoting international cooperation and assistance to enhance protection against the use or threat of chemical and biological weapons, as well as measures to maintain physical control of nuclear material worldwide; and (d) enhancing partnership building and political dialogue in the field of non-proliferation, arms control and disarmament.¹⁸

The 2003 EU Security Strategy, 'A Secure Europe in a Better World', listed the proliferation of WMD among the key threats that the EU faced:

Proliferation of weapons of mass destruction is potentially the greatest threat to our security. The international treaty regimes and export control arrangements have slowed the spread of WMD and delivery systems. We are now, however, entering a new and dangerous period that raises the possibility of a WMD arms race, especially in the Middle East. Advances in the

¹⁷ Council of the European Union, 'Implications of the terrorist threat for EU policy Conclusions', 2397th Council meeting, 15078/01 (Presse 460), Brussels, 10 Dec. 2001.

¹⁸ Council of the European Union (note 17).

Box 1. Key measures of the European Union (EU) Strategy against Proliferation of Weapons of Mass Destruction (WMD)**A. Rendering multilateralism more effective by acting resolutely against proliferators**

1. Working for the universalization and, when necessary, strengthening of the main treaties, agreements and verification arrangements on disarmament and non-proliferation.
2. Fostering the role of the United Nations Security Council.
3. Enhancing political, financial and technical support to verification regimes.
4. Strengthening and promoting adherence to export control policies and practice.
5. Enhancing the security of proliferation-sensitive materials, equipment and expertise in the EU against unauthorized access and risks of diversion.
6. Strengthening identification, control and interception of illegal trafficking.

B. Promoting a stable international and regional environment

1. Reinforcing EU co-operative threat-reduction programmes with other countries, targeted at support for disarmament, control and security of sensitive materials, facilities and expertise.
2. Integrating the WMD non-proliferation concerns into the EU's political, diplomatic and economic activities and programmes, aiming at the greatest effectiveness.

C. Cooperating closely with the United States and other key partners

1. Ensuring adequate follow-up to the EU–US declaration on non-proliferation issued at the June 2003 summit.
2. Ensuring coordination and, where appropriate, joint s with other key partners.

D. Developing the necessary structures within the EU

1. Organizing a six-monthly debate on the implementation of the EU Strategy at the External Relations Council.
2. Setting up a unit that would function as a monitoring centre, entrusted with the monitoring of the consistent implementation of the EU Strategy.

Source: Based on the EU Strategy against Proliferation of Weapons of Mass Destruction, chapter III, pp. 9–13.

biological sciences may increase the potency of biological weapons in the coming years; attacks with chemical and radiological materials are also a serious possibility. The spread of missile technology adds a further element of instability and could put Europe at increasing risk.¹⁹

The EU Strategy against the Proliferation of Weapons of Mass Destruction, adopted the same year, set out a 'living action plan' with specific measures in four priority domains: (a) strengthening multilateralism; (b) promoting a stable international and regional environment; (c) cooperating closely with the United States and other key partners; and (d) developing the necessary structures within the EU (see box 1).²⁰

In 2009, the Council issued a report that took stock of the implementation of the 2003 EU Security Strategy.²¹ The report acknowledged the fact that the risk of the proliferation of WMD by states and non-state actors

had heightened, and highlighted the value of the steps and measures that the EU had undertaken to address this risk. Specific areas in which additional action was required included: 'EU support for a multilateral approach to the nuclear fuel cycle; countering financing of proliferation; measures on biosafety and biosecurity; and containing proliferation of delivery systems, notably ballistic missiles.'²² More generally, the report drew attention to the nexus between security and development noting that peace and security are essential preconditions for achieving sustainable development.²³

The Council conclusions adopted in 2012 reiterated the need for enhancing the security of production, storage, handling and transportation of high-risk CBRN materials and explosives.²⁴ The conclusions further underlined the importance of interagency collaboration and public–private partnerships in developing effective prevention, detection, preparedness and response capacities for CBRN security risk mitigation. To advance action in these domains, in 2014 the European

¹⁹ Council of the European Union, *European Security Strategy: A Secure Europe in a Better World* (European Communities: Brussels, 2009), p. 31.

²⁰ Council of the European Union, 'Fight against the Proliferation of Weapons of Mass Destruction—EU Strategy against Proliferation of Weapons of Mass Destruction', Brussels, 10 Dec. 2003, pp. 9–13.

²¹ Council of the European Union (note 19).

²² Council of the European Union (note 19), p. 12.

²³ Council of the European Union (note 19), p. 19.

²⁴ Council of the European Union, Draft Council conclusions on the new CBRN-E Agenda, 16980/12, 29 Nov. 2012.

Commission issued a communication document that specifically addressed the value of strengthening engagement between stakeholders in public and private sectors, including by promoting research, innovation, and technology development and transfer.²⁵

The 2017 EU Action Plan to Enhance Preparedness against CBRN Security Risks observed that ‘tackling CBRN [security] risks requires a horizontal approach, cutting across diverse areas and actors such as law enforcement, emergency management, protection of critical infrastructure and public spaces, public health, and the private sector’.²⁶ To address the multifaceted nature of CBRN security risks, the action plan set four overarching objectives: (a) reducing the accessibility of CBRN materials; (b) ensuring a more robust preparedness for and response to CBRN security incidents; (c) building stronger internal–external links in CBRN security with key regional and international EU partners; and (d) enhancing the EU’s knowledge of CBRN risks.²⁷ The action plan underscored the need for deepening EU–North Atlantic Treaty Organization (NATO) cooperation and enhancing the existing synergies with international structures in the area of WMD non-proliferation and disarmament, including the IAEA, the OPCW, the BTWC and the UN Office for Disarmament Affairs.

The 2020 EU Security Union Strategy addresses CBRN security risks as part of the prevention and countering of terrorism and radicalization.²⁸ Key actions in this regard include establishing a mechanism for restricting the access to certain dangerous chemicals, strengthening civil protection response capacities, and promoting cooperation with third countries on fostering a sustainable CBRN safety and security culture.²⁹

²⁵ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new EU approach to the detection and mitigation of CBRN-E risks, COM(2014) 247, 5 May 2014.

²⁶ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Action Plan to enhance preparedness against chemical, biological, radiological and nuclear security risks, COM(2017) 610, 18 Oct. 2017, p. 4.

²⁷ European Commission (note 26).

²⁸ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the EU Security Union Strategy, COM(2020) 605, 24 July 2020.

²⁹ European Commission (note 28).

Under EU Directive 2017/541 on combating terrorism, member states are required to take measures to ensure that the manufacture, possession, acquisition, transport, supply or use of chemical, biological, radiological or nuclear weapons, as well as research into, and development of, chemical, biological, radiological or nuclear weapons are defined as offences under national law.³⁰

Council Regulation no. 428/2009 sets up a Community regime for the control of exports, transfer, brokering and transit of dual-use items.³¹ Under this regulation, the term ‘dual-use items’ refers to items, including software and technology, which can be used for both civil and military purposes, as well as all goods that can be used for both non-explosive uses and assisting in the manufacture of nuclear weapons or other nuclear explosive devices. Annex I of the regulation contains a ‘List of Dual-Use Items’ that are subject to export authorization and authorization for brokering services. The list implements internationally agreed dual-use control arrangements including the Wassenaar Arrangement, the Missile Technology Control Regime, the Nuclear Suppliers’ Group and the Australia Group, as well as the Annex on Chemicals to the CWC. The regulation contains provisions for the authorization procedures that need to be in place in member states, including a list of criteria for whether or not an authorization should be granted. Exporters and brokers are required to keep detailed registers or records of their exports or brokering services in accordance with the national law or practice in force in the respective member state.

Hybrid threats

The concept of ‘hybrid threats’ is used to ‘capture the mixture of coercive and subversive activity, conventional and unconventional methods (i.e. diplomatic, military, economic, technological), which can be used in a coordinated manner by state or non-state actors to achieve specific objectives

³⁰ Directive (EU) 2017/541 of the European Parliament and of the Council of 15 Mar. 2017 on combating terrorism and replacing Council Framework Decision 2002/475/JHA and amending Council Decision 2005/671/JHA, *Official Journal of the European Union*, L88/6, 31 Mar. 2017.

³¹ European Union, Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, *Official Journal of the European Union*, L134/1. See also Eurojust, *Eurojust CBRN-E Handbook* (Eurojust: The Hague, June 2017), version VI.

while remaining below the threshold of formally declared warfare'.³² Such activities tend to exploit the vulnerabilities of the target, in order to generate ambiguity and hinder decision-making processes. Threats that involve the use of unconventional means and CBRN materials merit particular attention, not least because of their potential scale and impact on society. With regard to biological security threats, the European Commission has noted that:

The population's health could be jeopardised by the manipulation of communicable diseases or the contamination of food, soil, air and drinking water by chemical, biological, radiological and nuclear (CBRN) agents. In addition, the intentional spreading of animal or plant diseases may seriously affect the food security of the Union and have major economic and social effects on crucial areas of the EU food chain. Existing EU structures for health security, environmental protection and for food safety can be used to respond to hybrid threats using these methods.³³

Following the recent cases involving the use of toxic chemical agents (the assassination of Kim Jong Nam with VX in 2017, as well as the poisoning with novichok of Sergei and Yulia Skripal in 2018 and Alexei Navalny in 2020), the EU's approach to countering CBRN hybrid threats has been further stepped up.³⁴ The EU has introduced a sanctions regime that can be imposed against persons or entities that provide financial, technical or material support, or are otherwise involved in the manufacturing, stockpiling, acquisition, transfer and use of chemical weapons, or in preparations for the use of such weapons.³⁵ To facilitate the implementation of the EU CBRN Action

Plan, the European Commission has recommended a number of additional steps including: (a) developing a list of chemical substances posing a particular threat, as a basis for operational action to reduce their accessibility; (b) setting up a dialogue with private actors in the supply chain to work together towards addressing evolving threats from chemicals that can be used as precursors; (c) carrying out a review of threat scenarios and an analysis of existing detection methods to improve the detection of chemical threats, with the aim of developing operational guidance for member states; and (d) collaborating with member states on the establishment of inventories of stockpiles of essential medical countermeasures, laboratory, treatment and other capacities.³⁶

Both the European Commission and the Council have underlined the importance of multilateralism and international cooperation with the UN institutions and specialized agencies, NATO and the Group of Seven (G7), in order to ensure the integrity of the established rule-based international order.³⁷

The Global Strategy for the European Union's Foreign and Security Policy notes that the 'proliferation of weapons of mass destruction and their delivery systems remains a growing threat' and acknowledges the synergistic effects of hybrid threats, terrorism and organized crime, which require a coherent external and internal policy action.³⁸ The strategy further seeks to contextualize the security and defence challenges that the EU faces within the broader framework of cross-cutting trends, such as climate change, economic volatility, resource scarcity, and scientific and technological advancement.

Advancing IAEA and OPCW activities and promoting BWC implementation

The EU supports the activities of IAEA in the area of nuclear security. Council Decision (CFSP) 2020/1656 of 6 November 2020 sets out projects that are funded by the EU and implemented by the IAEA in several

³² European Commission, Joint Communication to the European Parliament and the Council: Joint Framework on countering hybrid threats—a European Union response, JOIN(2016) 18, 6 Apr. 2016, p. 2.

³³ European Commission (note 32), p. 9.

³⁴ On the recent use of toxic chemical agents, see OPCW, 'OPCW Executive Council condemns chemical weapons use in fatal incident in Malaysia', News, 9 Mar. 2017; OPCW, 'Technical assistance provided by OPCW related to toxic chemical incidents in Salisbury and Amesbury', [n.d.]; and OPCW, 'OPCW issues report on technical assistance requested by Germany', 6 Oct. 2020.

³⁵ Council Decision (CFSP) 2018/1544 of 15 Oct. 2018 concerning restrictive measures against the proliferation and use of chemical weapons, *Official Journal of the European Union*, L259/25, 16 Oct. 2018.

³⁶ European Commission, Joint Communication to the European Parliament and the Council: Increasing resilience and bolstering capabilities to address hybrid threats, JOIN(2018) 16, 13 June 2018.

³⁷ European Commission (note 36); and Council of the European Union, Council conclusions on complementary efforts to enhance resilience and counter hybrid threats, 14972/19, Brussels, 10 Dec. 2019.

³⁸ European Union, *Shared Vision, Common Action: A Stronger Europe*, A Global Strategy for the European Union's Foreign and Security Policy, June 2016.

priority areas within the scope of the IAEA ‘Nuclear Security Plan, 2018–2021’:

1. Promoting the universalization of the Amendment to the Convention on the Physical Protection of Nuclear Material, enhancing computer security and information technology services, and fostering nuclear security culture.

2. Information management, with a focus on assessing nuclear security needs, priorities and threats.

3. Nuclear security of materials and associated facilities, with a focus on enhancing physical protection and nuclear material accounting and control for the whole fuel cycle, and a concept paper on the application of physical protection measures in the age of Covid-19.

4. Nuclear security of materials out of regulatory control, with a focus on institutional response infrastructure for material out of regulatory control.

5. Programme development and international cooperation, with a focus on education and training programme development.

6. Gender-focused capacity building and education in nuclear security.³⁹

The EU provides direct support for the activities of the OPCW in the area of chemical disarmament and chemical safety and security. Council Decision (CFSP) 2019/538 covers activities in seven priority domains:

1. Establishment of an OPCW Centre for Chemistry and Technology and supporting the creation of a mechanism for attribution of legal responsibility to address the threat of use of chemical weapons.

2. Chemical demilitarization and non-proliferation.

3. Operational training and capacity building in the area of assistance and protection in African states parties to the CWC.

4. International cooperation through laboratory twinning, education, outreach and training in chemical safety and security, analytical chemistry and chemistry for peaceful uses, with a particular focus on engaging women and youth.

5. Promoting the universality of the CWC through outreach and awareness raising and enhanced non-governmental organization (NGO) participation in the work of the OPCW.

³⁹ Council Decision (CFSP) 2020/1656 of 6 Nov. 2020 on Union support for the activities of the International Atomic Energy Agency (IAEA) in the areas of nuclear security and in the framework of the implementation of the EU Strategy against Proliferation of Weapons of Mass Destruction, *Official Journal of the European Union*, L372 I/4, 9 Nov. 2020.

6. Strengthening the national implementation of the CWC by facilitating multi-stakeholder engagement and collaboration.

7. Facilitating the review and assessment of scientific and technological developments with relevance to the CWC.⁴⁰

The EU provides direct support for the international implementation of the BWC through Council Decision (CFSP) 2019/97 of 21 January 2019, which is being implemented until 2022.⁴¹ The Council decision covers six thematic areas of relevance to the BWC:

1. Support for the BWC universalization through in-country stakeholder engagement and regional awareness-raising workshops.

2. Capacity development in support of BWC national implementation through legislative assistance, training and peer-review exercises.

3. Fostering biosecurity networks in the Global South by engaging next-generation professionals with the BWC.

4. Supporting the intersessional programme and preparations for the Ninth Review Conference of the BWC through outreach and awareness-raising activities, sponsorship opportunities and stakeholder engagement events.

5. Preparedness of states parties to prevent and respond to attacks involving biological agents through tabletop exercises, training and expert workshops.

6. Enabling tools for outreach, education and engagement, in order to enhance awareness of the scope of the BWC and its relevance to the efforts to ensure a holistic counter of disease outbreaks, and strengthening the prevention of life science misuse.⁴²

A cross-cutting element in the EU’s approach to cooperation is the emphasis on promoting greater engagement among civil society stakeholders, including academia and industry, with the implementation of the multilateral agreements in the area of WMD

⁴⁰ Council Decision (CFSP) 2019/538 of 1 Apr. 2019 in support of activities of the Organisation for the Prohibition of Chemical Weapons (OPCW) in the framework of the implementation of the EU Strategy against Proliferation of Weapons of Mass Destruction, *Official Journal of the European Union*, L93/3, 2 Apr. 2019.

⁴¹ Council Decision (CFSP) 2019/97 of 21 Jan. 2019 in support of the Biological and Toxin Weapons Convention in the framework of the EU Strategy against Proliferation of Weapons of Mass Destruction, *Official Journal of the European Union*, L19/11, 22 Jan. 2019.

⁴² Council Decision (CFSP) 2019/97 (note 41).

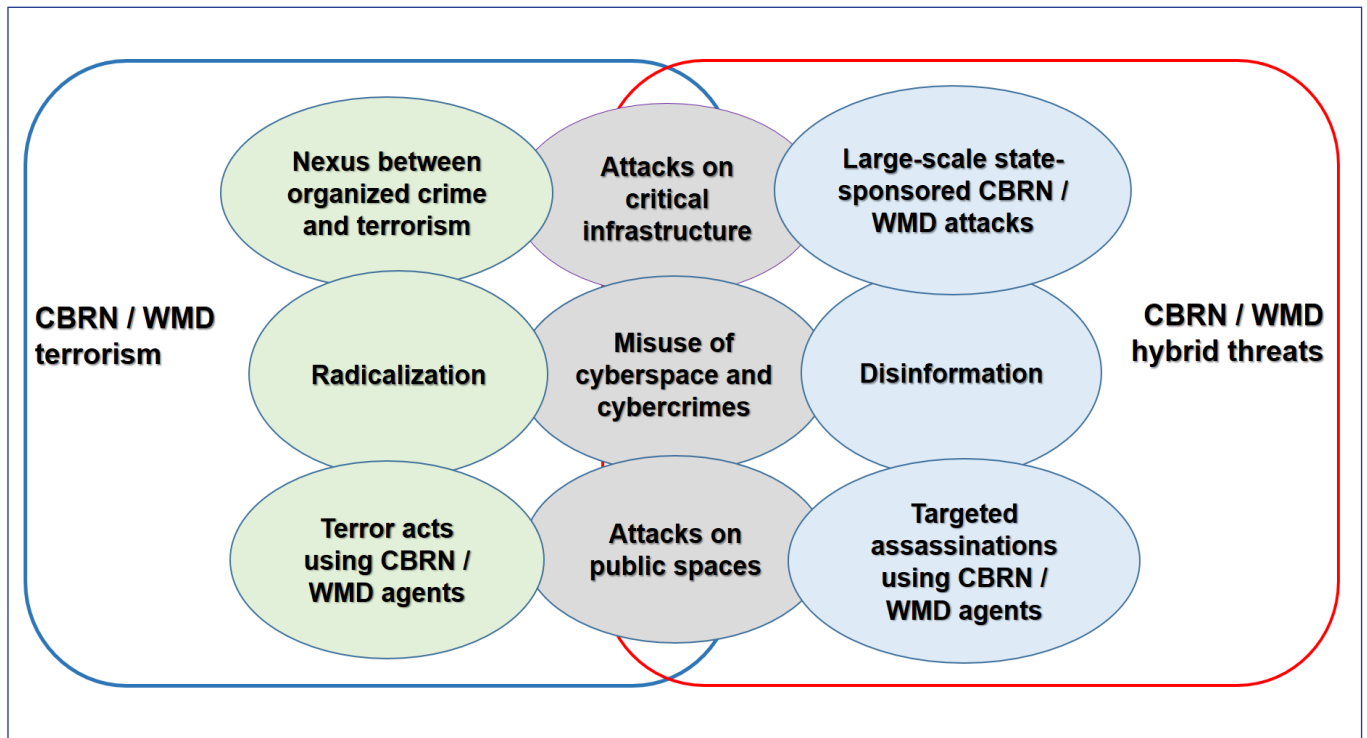


Figure 2. The chemical, biological, radiological and nuclear risk spectrum

CBRN = chemical, biological, radiological and nuclear; WMD = weapon(s) of mass destruction

Sources: Authors' compilation. This figure is informed by European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the EU Security Union Strategy, COM(2020) 605, 24 July 2020; and European Commission, Joint Communication to the European Parliament and the Council: Increasing resilience and bolstering capabilities to address hybrid threats, JOIN(2018) 16, 13 June 2018.

non-proliferation and disarmament, including through advancing education, research and awareness raising.⁴³

EU CBRN Centres of Excellence Initiative

Launched in 2010, the EU CBRN Centres of Excellence Initiative is a key instrument for promoting cooperation and assistance in the area of CBRN safety and security governance.⁴⁴ The initiative is supported through the Instrument contributing to Stability and Peace and implemented by the European Commission in cooperation with the UN Interregional Crime and Justice Research Institute. The initiative is underpinned by an

all-hazard approach and provides a flexible framework for engagement and experience sharing between EU stakeholders and partner countries in the area of strengthening the prevention, detection, preparedness and response to CBRN risks, regardless of their origins. This includes risks related to the deliberate misuse of CBRN materials and knowledge.

In terms of structure, there are 62 participating partner countries that are grouped in eight regions, each assisted by a designated regional secretariat. The regional secretariats offer technical guidance and support to partner countries in the implementation of CBRN-related projects. Each partner country is required to designate a National Focal Point and establish a CBRN national team to facilitate coordination at national and regional level and communication with EU stakeholders.

The activities carried out within the framework of the initiative seek to offer tailored services that take into account the local needs and circumstances in partner countries. The main emphasis is on capacity building for effective CBRN safety and security

⁴³ Council Decision (CFSP) 2017/809 of 11 May 2017 in support of the implementation of United Nations Security Council Resolution 1540 (2004) on the non-proliferation of weapons of mass destruction and their means of delivery, *Official Journal of the European Union*, L121/39, 12 May 2017; and Council Decision (CFSP) 2018/299 of 26 Feb. 2018 promoting the European network of independent non-proliferation and disarmament think tanks in support of the implementation of the EU Strategy against proliferation of weapons of mass destruction, *Official Journal of the European Union*, L56/46, 28 Feb. 2018.

⁴⁴ European Union (note 16).

governance. This includes assistance in setting up local structures, including legislative, policy and strategic frameworks (e.g. a CBRN National Action Plan) for inter-agency collaboration and coordination; strengthening the existing infrastructure through technology transfer and equipment upgrade; and developing operational capacity through training and awareness raising.⁴⁵

IV. KEY PREREQUISITES FOR ENHANCING CROSS-SECTORIAL INTERACTION IN THE IMPLEMENTATION OF CBRN SECURITY

This section outlines a set of key requirements for enhancing cross-sectorial collaboration, coordination and communication at national and international level in order to strengthen CBRN security risk management. A vital element of this process is the need for sensitizing public and private stakeholders to the goals of WMD disarmament and non-proliferation regimes, not least because these regimes are at the heart of ensuring that biological, chemical and nuclear materials and related knowledge are used only for peaceful purposes. Engaging public and private stakeholders with the implementation and strengthening of the WMD disarmament and non-proliferation regimes requires an integrated combination of flexible and adaptive voluntary and enforceable elements.

The complex and multidimensional nature of the spectrum of CBRN security risks and the ways in which the continuous advancement of science and technology impacts on the manifestation of CBRN security threats merit specific attention. The security landscape has been rapidly evolving since the end of the cold war, whereby traditional security concerns (e.g. proliferation of WMD and maintaining strategic stability) have been exacerbated and novel security risks have emerged (e.g. novel CBRN capabilities and increasing availability of CBRN materials and information). A crucial factor in this regard has been the rapid pace of scientific and technological advancement over the past few decades, including increasing digitalization, the deployment of artificial intelligence and the expansion of cyberspace. The security arena has been redefined as a result, leading to the confluence of illicit activities that, at times, may hinder the identification of perpetrators and make

attacks difficult to attribute. Thus, when analysing the complexity of the CBRN security risk spectrum, it is important to acknowledge the possible synergies between malign activities and their cumulative effects (see figure 2).

Key prerequisites at national level

The implementation of policies, regulations and measures for preventing and countering the hostile misuse of CBRN materials and knowledge at national level requires an integrated framework for action. To facilitate effective engagement among public and private stakeholders, it is important that such a framework features at least five basic components—three thematic and two functional. The thematic elements include: (a) oversight of activities involving CBRN materials and information, including science research; (b) law enforcement and counterterrorism; and (c) civil protection and preparedness.⁴⁶ The functional elements include: (a) a whole-of-government approach; and (b) a whole-of-society approach.⁴⁷ These elements are interdependent and fundamental for the prevention, preparedness and response to CBRN security risks (see figure 3).

The thematic elements refer to the main areas of action that need to be considered with regard to the prevention and countering of CBRN security risks. The first thematic element, oversight of activities involving CBRN materials and information, including science research, is critical both for the prevention of the deliberate misuse of CBRN materials and information and for ensuring the effective functioning of the other two elements. It covers the following domains:

1. Occupational safety, including the safe handling, use, transfer and transport of CBRN materials and sound CBRN waste management.
2. Physical security, including safeguarding CBRN materials and information against unauthorized

⁴⁶ Novosiolova, T., Bakanidze, L. and Perkins, D., 'Effective and comprehensive governance of biological risks: A network of networks approach for sustainable capacity building', eds B. Trump, et al., *Synthetic Biology 2020: Frontiers in Risk Analysis and Governance* (Springer: 2020).

⁴⁷ On the need for a holistic multi-stakeholder approach to CBRN governance, see Martellini, M. and Malizia, A. (eds), *Cyber and Chemical, Biological, Radiological, Nuclear, Explosives Challenges: Threats and Counter Efforts* (Springer: 2017); and Martellini, M. and Trapp, R. (eds), *21st Century Prometheus: Managing CBRN Safety and Security Affected by Cutting-Edge Technologies* (Springer: 2020).

⁴⁵ European Union (note 16).

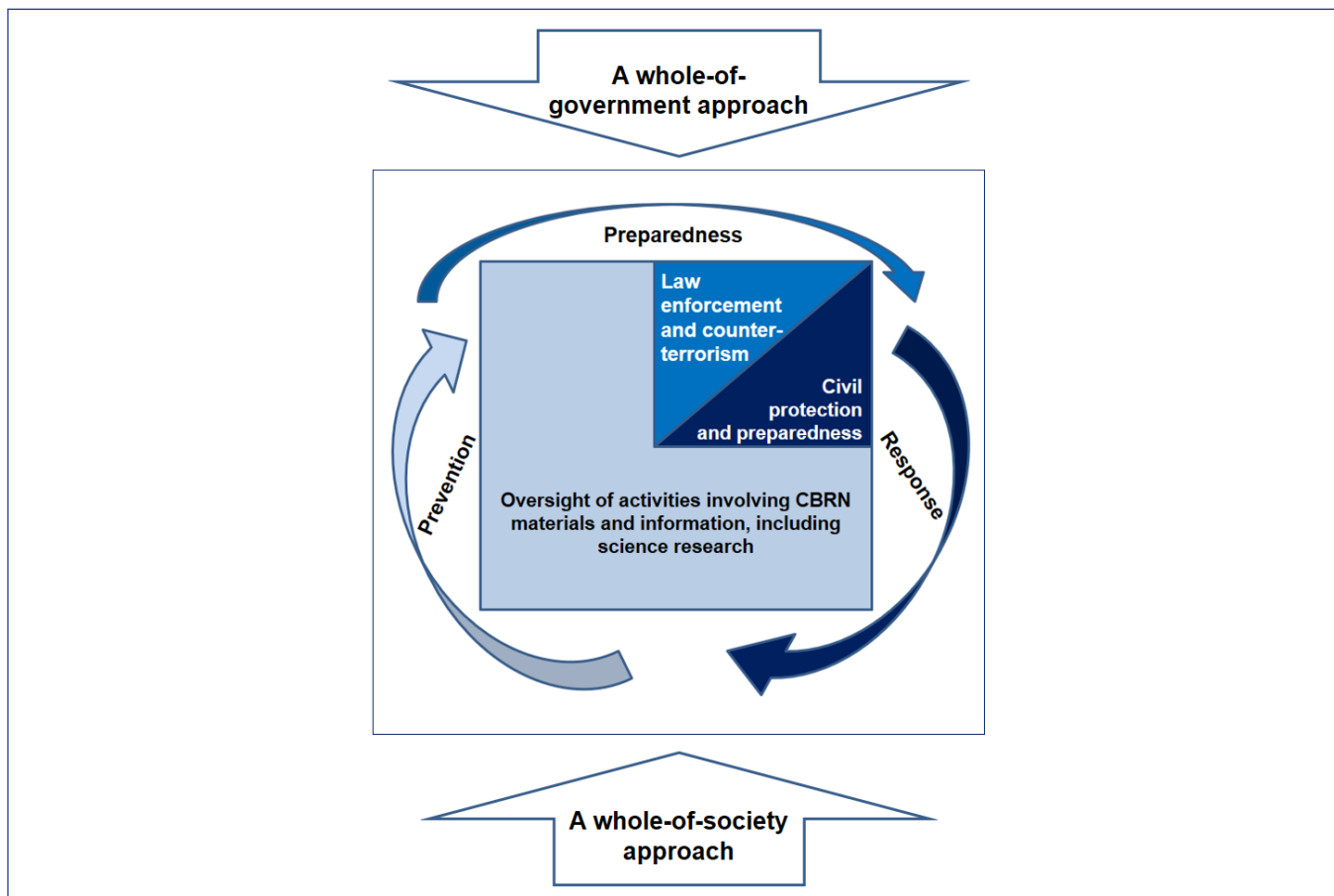


Figure 3. Implementing chemical, biological, radiological and nuclear security at national level: An indicative model
 CBRN = chemical, biological, radiological and nuclear
 Source: Authors' compilation.

access, theft, loss, misplacement or misuse; personnel reliability; transport security; and cybersecurity.

3. WMD-relevant export and import controls in accordance with the provisions of UN Security Council Resolution 1540 and relevant multilateral non-proliferation and disarmament agreements and arrangements.

4. Responsible conduct of science, including governance of dual-use research, sensitizing stakeholders to the risks related to WMD proliferation, public engagement and enhancing disinformation resilience.

The second thematic element, law enforcement and counterterrorism, covers the following domains:

1. Penal legislation criminalizing the misuse of CBRN materials and WMD/CBRN terrorism.

2. Strengthening the protection of public spaces against CBRN security threats.

3. Multi-agency operational capacity for detecting, countering and investigating acts of terror, including strengthening border controls for combatting the illicit

trafficking of WMD and CBRN materials; enhancing cybersecurity and combating cybercrime; intelligence gathering and data sharing; and developing CBRN forensic capabilities.

4. Regional and international police cooperation, including experience sharing and exchange of information in the area of WMD/CBRN counterterrorism.

5. Fostering partnerships with civil society stakeholders, including industry and academia, in order to strengthen the CBRN security culture.

The third thematic element, civil protection and preparedness, covers the following domains:

1. Enhancing the protection and resilience of critical infrastructure against CBRN security threats.

2. Promoting situational awareness among government and civil society stakeholders of CBRN/WMD hybrid threats and their possible manifestations.

3. Strengthening multi-agency operational capacity for the prevention, identification and management of CBRN security incidents.

4. Embedding the principles of chemical, biological and radiological/nuclear defence in the operational practice of competent authorities.

5. Participation in WMD non-proliferation and disarmament multilateral agreements.

6. Regional and international cooperation, including the provision of or request for assistance in case of a deliberate CBRN incident.

The functional elements refer to the types of mechanisms required for the effective implementation of the thematic elements. The first, a whole-of-government approach, underscores the need for effective cooperation and coordination among all government sectors in order to strengthen prevention, preparedness and response to deliberate CBRN risks. It is important to provide policy and strategic context for inter-agency cross-sectorial collaborative work at national level, in order to ensure the harmonization and synchronization of top-down governance initiatives, which can be legally binding (e.g. regulations, legal acts, orders and instructions) or non-binding (programmes, strategies, guidelines and recommendations).

The second functional element, a whole-of-society approach, underscores the importance of engaging civil society stakeholders, including private industry, professional associations, academic institutions and the general public, with the prevention, preparedness and response to deliberate CBRN risks. It is essential that mechanisms for promoting the participation of civil society stakeholders in the governance of deliberate CBRN risks are in place, in order to facilitate the development of self-regulatory, bottom-up governance initiatives (e.g. institutional policies, standard operating procedures, codes of conduct, and educational and training programmes). Creating opportunities for sustained civil society participation in policy- and decision-making processes is key to enhancing cooperation, coordination and communication among stakeholders and promoting a culture of trust and transparency.

Key prerequisites at international level

Strengthening CBRN security risk management at international level requires the effective integration of the efforts to prevent and counter the hostile misuse of CBRN materials and knowledge with the efforts to prevent and manage the unintentional release of CBRN materials and its potential adverse effects on humans,

animals, infrastructure and the environment (see figure 4).

At the same, there is a need for further harmonizing the efforts to uphold the established norms on WMD disarmament and non-proliferation. The cooperation and cross-fertilization across the deliberative processes of the three main WMD disarmament agreements—the BWC, the CWC and the NPT—should be enhanced, in order to identify common approaches for strengthening compliance and promoting effective nuclear, chemical and biological security capacity building and stakeholder engagement. The outcomes, considerations and actions agreed in international forums that focus on the security impact of emerging technologies, including cyber technologies and artificial intelligence, need to be fed into the WMD disarmament proceedings. Such forums include, for example, the Group of Governmental Experts on Advancing Responsible State Behaviour in Cyberspace in the Context of International Security and Artificial Intelligence and the Group of Governmental Experts on Lethal Autonomous Weapons Systems. The existing synergies between the fields of WMD disarmament and WMD/CBRN counterterrorism, particularly as regards the activities of the 1540 Committee, the International Criminal Police Organization (INTERPOL) and the UN Counter-Terrorism Centre, should be deepened.

V. IMPLICATIONS FOR EU CBRN SECURITY POLICY

Preventing and countering the hostile misuse of CBRN materials and information in the 21st century requires that the integrity of the established international norms on WMD disarmament and non-proliferation remains intact. Sensitizing public and private stakeholders active in the area of CBRN security risk management to the ways in which they can contribute to strengthening the implementation of the existing WMD disarmament and non-proliferation regimes is a vital element of this process. This is particularly important given the rapid scientific and technological advancement, which holds an enormous potential to permanently redefine the international security landscape. The EU has a vital role to play in promoting effective action at national, regional and international level to ensure the effective implementation of the international agreements and arrangements in the area of WMD disarmament and non-proliferation and to contribute to the harmonization of CBRN security governance. There are three key areas in which EU activities in the sphere of CBRN

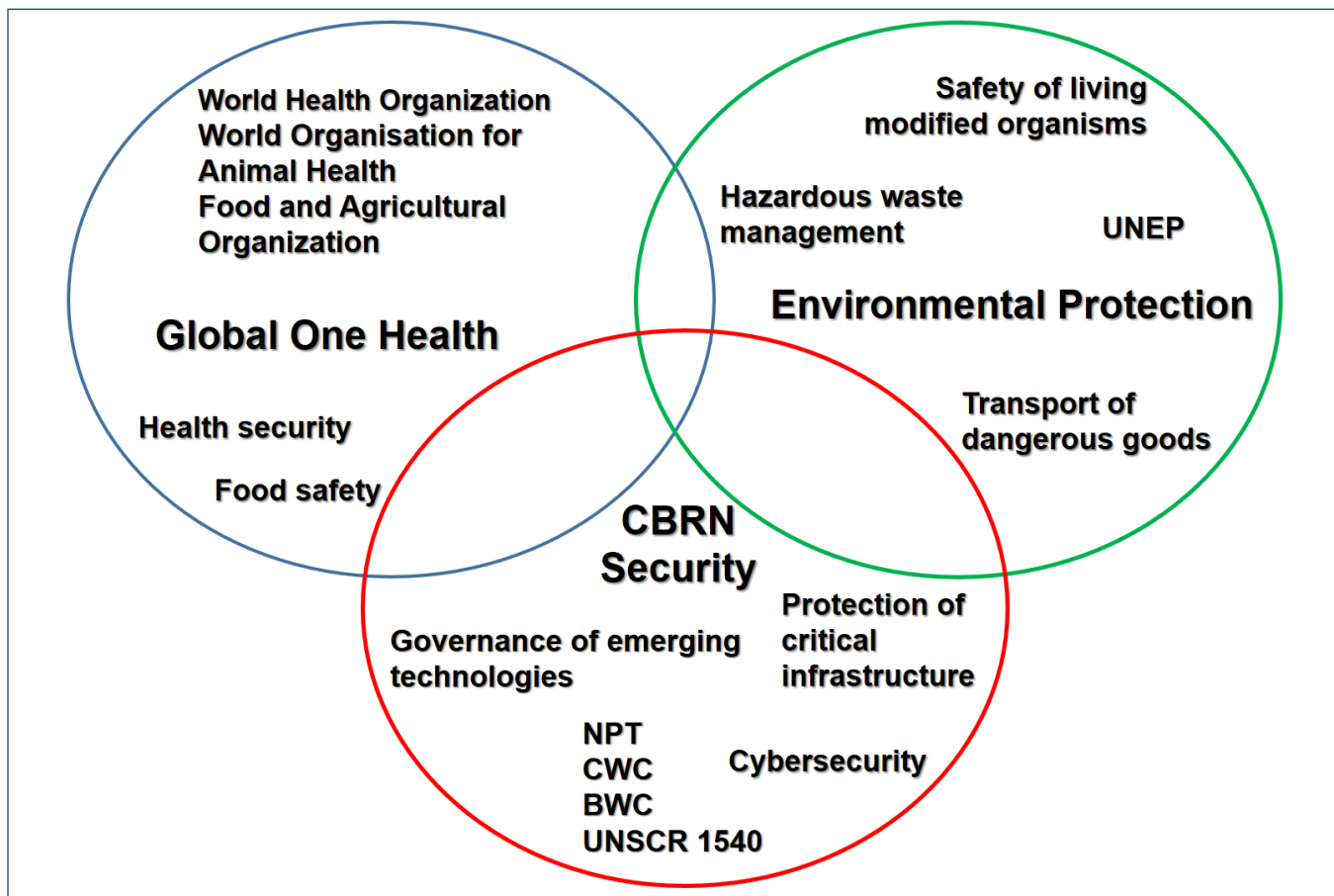


Figure 4. Strengthening CBRN security risk management at international level

BWC = Biological and Toxin Weapons Convention; CBRN = chemical, biological, radiological and nuclear; CWC = Chemical Weapons Convention; NPT = Non-Proliferation Treaty; UN = United Nations; UNEP = UN Environment Programme; UNSCR 1540 = UN Security Council Resolution 1540

Source: Authors' compilation.

security risk management can have a significant and lasting impact.

First, the EU CBRN security policy should provide a framework for fostering adaptive national capacities for effective CBRN security risk management. It is essential that arrangements for promoting stakeholder engagement with the goals of WMD disarmament and non-proliferation are built into the internal and external EU CBRN security policies, as well as into the EU strategy for promoting sustainable development.⁴⁸ A coherent and integrated approach to strengthening nuclear, chemical and biological safety and security within member states and the partner countries

⁴⁸ Annex to the Communication from the Commission to the European Parliament, the European Council, the Council, the European Social and Economic Council, and the Committee of the Regions, 'The European Green Deal', COM(2019) 640, 11 Dec. 2019. See also European Commission, 'A European Green Deal', [n.d.].

participating in the EU CBRN Centres of Excellence Initiative is required to guarantee that advances in science and technology are used only for peaceful purposes and the benefit of mankind.

Second, the EU should continue to enhance the effectiveness and efficiency of the existing mechanisms for developing a robust foundation for research, innovation, and technology development and transfer in the area of CBRN security. For example, the synergies between pan-European initiatives, such as the Community of European Research and Innovation for Security and the European Defence Agency's Overarching Strategic Research Agenda, should be maximized to ensure that the outcomes of CBRN security research and innovation are cost-effective and tailored to the defence needs of member states.⁴⁹

⁴⁹ European Commission, Community of European Research and Innovation for Security (CERIS) website; and European Defence Agency, *OSRA—Overarching Strategic Research Agenda and CapTech*

Third, and finally, the EU should strengthen its leadership standing in the multilateral forums on WMD disarmament and non-proliferation, counterterrorism and cybersecurity governance. Opportunities for international cooperation (e.g. with the Global Partnership against the Spread of Weapons and Materials of Mass Destruction and NATO) and broad stakeholder engagement across public, private and civil society actors should be leveraged, in order to inform the development of integrated, standardized strategies, approaches and tools for building sustainable capacity for effective CBRN security risk management.⁵⁰

SRA Harmonisation: Connecting R&T and Capability Development
(European Defence Agency: Brussels, [n.d.]).

⁵⁰ Global Partnership against the Spread of Weapons and Materials of Mass Destruction website; and Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence website.



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A EUROPEAN NETWORK

In July 2010 the Council of the European Union decided to support the creation of a network bringing together foreign policy institutions and research centers from across the EU to encourage political and security-related dialogue and the long-term discussion of measures to combat the proliferation of weapons of mass destruction (WMD) and their delivery systems. The Council of the European Union entrusted the technical implementation of this Decision to the EU Non-Proliferation Consortium. In 2018, in line with the recommendations formulated by the European Parliament the names and the mandate of the network and the Consortium have been adjusted to include the word 'disarmament'.

STRUCTURE

The EU Non-Proliferation and Disarmament Consortium is managed jointly by six institutes: La Fondation pour la recherche stratégique (FRS), the Peace Research Institute Frankfurt (HSFK/ PRIF), the International Affairs Institute in Rome (IAI), the International Institute for Strategic Studies (IISS), the Stockholm International Peace Research Institute (SIPRI) and the Vienna Center for Disarmament and Non-Proliferation (VCDNP). The Consortium, originally comprised of four institutes, began its work in January 2011 and forms the core of a wider network of European non-proliferation and disarmament think tanks and research centers which are closely associated with the activities of the Consortium.

MISSION

The main aim of the network of independent non-proliferation and disarmament think tanks is to encourage discussion of measures to combat the proliferation of weapons of mass destruction and their delivery systems within civil society, particularly among experts, researchers and academics in the EU and third countries. The scope of activities shall also cover issues related to conventional weapons, including small arms and light weapons (SALW).

www.nonproliferation.eu

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Promoting the European network of independent non-proliferation and disarmament think tanks

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