

EU preparedness and responses to Chemical, Biological, Radiological and Nuclear (CBRN) threats



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STUDY

EU preparedness and responses to Chemical, Biological, Radiological and Nuclear (CBRN) threats

ABSTRACT

This study on 'EU preparedness and responses to Chemical, Biological, Radiological and Nuclear (CBRN) threats' was requested by the European Parliament's (EP) Subcommittee on Security and Defence (SEDE) in the context of, but not limited to, the ongoing COVID-19 pandemic. Building on reports and expert input, this study first provides an update of the current level of each of the C, B, R and N threat elements, including the type of actor from which such threats might stem. It furthermore takes stock of the existing preparedness and response mechanisms and matches these against the updated threat landscape to determine the current state of play of the EU's response tools and its remaining gaps where improvement may be needed. The study puts forward a number of recommendations on specific issues. The core of the recommendations builds on using a 'Team Europe' approach to create and maintain a strong task force based response capacity, with additional authority and competence given by EU Member States to the EU. This would enable the EU to better support and manage an EU-wide crisis response in the CBRN field in a timely and effective manner.

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The content of this document is the sole responsibility of the authors, and any opinions expressed herein do not necessarily represent the official position of the European Parliament.

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List of Abbreviations

ABC	Atomic Biological Chemical
ATT	Arms Trade Treaty
BTWC	Biological and Toxin Weapons Convention
BWC	Biological Weapons Convention
CAAR	Consolidated Annual Activity Report (Europol)
CARD	Coordinated Annual Review on Defence
CBRN CoE	EU Chemical, Biological, Radiological and Nuclear Risk Mitigation Centres of Excellence
CBRN	Chemical, Biological, Radiological, Nuclear
CBRND	Chemical, Biological, Radiological, Nuclear Defence
CBRNDTR	Chemical, Biological, Radiological, Nuclear Defence Training Range

CBRNE/CBRNe	Chemical, Biological, Radiological and Nuclear explosive substances or events
CBRNSaaS	Chemical, Biological, Radiological, Nuclear Surveillance as a Service
CDP	Capability Development Plan
CEA	Le Commissariat à l'énergie atomique et aux énergies alternatives (French Alternative Energies and Atomic Energy Commission)
CFSP	Common Foreign and Security Policy
CJEU	Court of Justice of the European Union
CNS	James Martin Centre for Nonproliferation Studies
CoU	Community of Users
CSDP	Common Security and Defence Policy
CTR	Counter-Terrorism Register
CW	Chemical Weapon(s)
CWA	Chemical Weapon Agent
CWC	Chemical Weapons Convention
DG DEVCO	European Commission Directorate-General for International Cooperation and Development
DG ECHO	European Commission Directorate-General for European Civil Protection and Humanitarian Aid Operations
DG GROW	European Commission Directorate-General for the Internal Market, Industry, Entrepreneurship and SMEs
DG HOME	European Commission Directorate-General for Migration and Home Affairs
DG INTPA	European Commission Directorate-General for International Partnerships
DG SANTE	European Commission Directorate-General for Health and Food Safety
DG TAXUD	European Commission Directorate-General for Taxation and Customs Union
DG TRADE	European Commission Directorate-General for Trade
DIY	Do-It-Yourself
DNAT	Delegation to the NATO Parliamentary Assembly
EBDS	European Union Bomb Data System
ECA	European Court of Auditors
ECDC	European Centre for Disease Prevention
ECHA	European Chemicals Agency
ECURIE	European Community Urgent Radiological Information Exchange
EDA	European Defence Agency
EDEN	End-user Driven Demo for CBRNE
EDF	European Defence Fund
EEA	European Economic Area

EEAS	European External Action Service
EEODN	European Explosive Ordnance Disposal Network
EERC	European Emergency Response Capacity
EID	Emerging Infectious Diseases
EMA	European Medicines Agency
EMC	European Medical Command
ENCIRCLE	European CBRN Innovation for the Market Cluster
ENVI	Environment, Public Health and Food Safety
EP	European Parliament
EPF	European Peace Facility
ESDP	European Security and Defense Policy
EU BGs	EU Battlegroups
EU	European Union
EUCPM	EU Civil Protection Mechanism
EUGS	EU Global Strategy for Foreign and Security Policy
EURDEP	European Radiological Data Exchange Platform
EUSECTRA	The European Nuclear Security Training Centre
FBI	Federal Bureau of Investigation (US)
FOC	Full Operational Capability
FP7	Seventh Framework Programme
FPI	Service for Foreign Policy Instruments
HCoC	Hague Code of Conduct
HME	Homemade explosives
IAEA	International Atomic Energy Agency
ICBM	Intercontinental Ballistic Missile
ICSANT	International Convention for the Suppression of Acts of Nuclear Terrorism
IcSP	The EU's Instrument contributing to Stability and Peace
IED	Improvised Explosive Device
IfS	Instrument for Stability
IIIM	International, Impartial and Independent Mechanism
IOC	Initial Operating Capability
ISF	The EU's Internal Security Fund
JCPOA	Joint Comprehensive Plan of Action
JPM	Joint Procurement Mechanism
JRC	Joint Research Centre

MASC-CBRN	Methodology for Assessing States' Capacity for Countering the Hostile Misuse of CBRN Knowledge and Materials
MEP	Member of the European Parliament
MEST	Mobile Expert Support Team
MFF	Multiannual Financial Framework
MMCC/EMC	Multinational Medical Coordination Centre / European Medical Command
MS	Member States
NAQ	Needs Assessment Questionnaire
NATO	North Atlantic Treaty Organization
NBC	Nuclear Biological Chemical
NFI	<i>Nederlands Forensisch Instituut</i> (Dutch Forensic Institute)
NPD	Non-Proliferation and Disarmament
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NTI	Nuclear Threat Initiative
OC	Organised Crime
OPCW	Organisation for the Prohibition of Chemical Weapons
OSCE	Organization for Security and Co-operation in Europe
P2P	Partner to Partner
PESCO	Permanent Structured Cooperation
PPE	Personal Protective Equipment
RDD	Radiological Dispersal Devices
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (regulation)
RED	Radiation Exposure Devices
SALW	Small-Arms and Light Weapons
SEDE	Subcommittee on Security and Defence
SHARP JA	Strengthened International Health Regulations and Preparedness in the EU
SOCTA	Serious and Organised Crime Threat Assessment
TCA	Trade and Cooperation Agreement (EU-UK)
TERR	Special Committee on Terrorism
TE-SAT	EU Terrorism Situation and Trend Report
TEU	Treaty on European Union
TLD	Transatlantic Legislators' Dialogue
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle

UCPM	Civil Protection Mechanism
UK	United Kingdom
UN	United Nations
UNCCT	United Nations Counter-Terrorism Centre
UNIDIR	United Nations Institute for Disarmament Research
UNOCT	United Nations Office of Counter-Terrorism
UNODA	United Nations Office of Disarmament Affairs
UNODC	United Nations Office on Drugs and Crime
UNODC/TPB	United Nations Office on Drugs and Crime, Terrorism Prevention Branch
US	United States of America
USAREUR	United States Army Europe and Africa
US-DoE	United States Department of Energy
WHO	World Health Organisation
WMD	Weapons of Mass Destruction

Glossary

This glossary contains a selection of terms deemed relevant for this study. It primarily builds on the terms as defined in the European Commission's CBRN Glossary¹, but also added additional terms where necessary.

Absorbed radiation dose: The absorbed radiation dose corresponds to the energy transferred by a radiation into the matter. The measurement unit is gray, symbol Gy. 1 Gy = 1 joule per kilogram.

Aerosol: A suspension in a gaseous medium of small solid or liquid particles. A gaseous / solid Aerosol is referred to as dust, smoke or fume, a gaseous / liquid one as a mist. Aerosols have negligible falling velocity and can therefore remain viable and airborne for extended periods.

Anthrax: See: *Bacillus anthracis*

Antidote: A drug (with known mechanism of action) given to an intoxicated patient to counteract the toxic effects by modifying the toxicokinetics or toxicodynamics of the poison, and whose administration reliably produces a significant benefit.

Bacillus anthracis: Bacteria, whose spores cause a serious disease (Anthrax) in humans or animals. Infectious routes are cutaneous (skin contact), pulmonary (inhalation) or oral (ingestion). Clinical symptoms are dependent from infectious route. No known transmission between humans.

Biological agent: Biological agents shall mean micro-organisms (includes genetically modified organisms), cell cultures and parasites, some of them may be able to provoke any infection, allergy or toxicity in humans, animals, or plants that can be used in bioterrorism or biological warfare.

Biological warfare: The deliberate use of disease-producing microorganisms, toxic biological products, or organic biocides by either nations or non-governmental bodies to induce death or disabilities in humans and/or animals and/or damage to plant crops, etc.

Biosafety: Measuring assembly (containment principles, technologies and practices) that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release.

Biosecurity: Measuring assembly (access control, security procedures) to reduce the risk of transmission of infectious diseases and invasive alien species and to prevent the malicious use of dangerous pathogens, parts of them or toxins in direct or indirect act against humans, livestock or crops.

Bioterrorism: The intentional release or dissemination by terrorist of biological agents (bacteria, viruses, or toxins) to cause fear, illness or death in people, animals or plants and/or disrupting social, economic or political stability.

Blister agent: Chemical agent that causes blistering of the skin as well as severe skin, eye and mucosal pain and irritation. Larger doses can cause death.

Blood Agent: Chemical agents that injure a person by interfering with cell respiration (the exchange of oxygen and carbon dioxide between blood and tissues). This is a descriptive term for the cyanides.

Boiling Point: Temperature at which a substance starts to change from the liquid into the gaseous physical state.

Clostridium Botulinum: a bacterium that produces dangerous toxins (botulinum toxins) under low-oxygen conditions².

CBRN: CBRN is an acronym for chemical, biological, radiological, and nuclear issues that could harm the society through their accidental or deliberate release, dissemination, or impacts. The term CBRN is a

¹ European Commission, [CBRN Glossary](#).

² [Factsheet "Botulism"](#), World Health Organisation. Accessed on July 1, 2021.

replacement for the cold war term NBC (nuclear, biological, and chemical), which had replaced the previous term ABC (atomic, biological, and chemical) that was used in the fifties. 'N' covers the impact by an explosion of nuclear bombs and the misuse of fissile material, 'R' stands for dispersion of radioactive material e.g. by a dirty bomb.

CBRN resilience: Is the ability to reduce the risk from CBRN attacks (UK definition) or the capacity to anticipate risks and to limit their impact in order to return to the previous state (US definition).

Chemical weapon: A weapon specifically designed to cause death or other harm through the toxic properties of chemicals. It consists of the substance or agent (CWA) and of some form of carrier or container (e.g. ammunition).

Chlorine: Chlorine (Cl₂) is a toxic gas of characteristic stinging odour.

Contamination: Presence or transfer of hazardous chemical, biological or radioactive substances materials on humans, mobile and immobile objects, soil and water.

Cyanide: A cyanide (Hydrogen Cyanide: AC or Cyanogen Chloride CK) is a chemical compound that contains the cyano group.

Dark Web: a restricted part of the internet. Its content is not indexed, and it can only be accessed by using unique software, configuration or authorisation to access³.

Decontamination: The reduction of C, B, R&N contamination of the surfaces of living organisms, soil, water or objects.

Detection: In nuclear, biological, and chemical (NBC) environments, the act of locating CBRN hazards or discovering or perceiving the presence of (biological agents, diseases, etc.).

Disease: An unhealthy condition of the body (or a part of it) or the mind (illness, sickness) presented by symptoms peculiar to it. Chronic diseases are diseases of long duration (3 months or more) and generally slow progression. Nosocomial disease is a disease acquired in a hospital, especially in reference to an infection.

Dissemination: A spreading abroad for some fixed purpose or with some definite effect, e.g. disease progression by expanding step by step in a population

Epidemic: The occurrence of more cases and fast spreading of a disease than would be expected in a given area or among a specific group of people during a given time period. An epidemic is not a characterization of how many members or what proportion of the population is infected but is defined by how fast it is growing.

Exposure: Process by which a CBRN substance/material becomes available for absorption, swallowing, breathing, touching the skin or eyes to humans. Exposure may be short term (acute exposure), medium-term or long-term (chronic exposure).

Fissile material: In nuclear engineering, a fissile material is one that is capable of sustaining a chain reaction of nuclear fission. In the arms control context, the term 'fissile' is used to describe materials that can be used in the fission primary of a nuclear weapon. These are materials that sustain an explosive fast fission chain reaction. Uranium-233, Uranium-235, Plutonium-239 and Plutonium-241 are fissile materials.

Hazard: An accidental or naturally occurring phenomenon with the potential to cause physical or psychological harm to humans including loss of life, damage or losses of property, and/or disruption to the environment or to structures (economic social, political) upon which a community's way of life depends.

Host: A person or an animal that can be infected by an infectious agent under natural (as opposed to experimental) conditions.

³ FBI, 'A Primer on DarkNet Marketplaces : What they are and what law enforcement is doing to combat them', 2016.

Infectious / infectious agent: Is a biological agent such as viruses, bacteria, prion, parasites, or fungus that causes disease to its host (pathogen)

Nerve Agents: Nerve agents represent a group of chemical warfare agents.

Nuclear forensics: The analysis of intercepted illicit nuclear or radioactive material and any associated material to provide evidence for nuclear attribution.

Nuclear material: Nuclear material refers to uranium, plutonium, and thorium, in any form. This is differentiated further into 'source material', consisting of natural and depleted uranium, and 'special fissionable material', consisting of enriched uranium (uranium 235), uranium-233, and plutonium-239. See also radioactive material

Nuclear security: Implementation of the Nuclear Security covers three areas: Prevention to protect nuclear and other radioactive material and facilities and transports from malicious acts; Detection of and response to malicious acts involving nuclear and other radioactive material; Information coordination and analysis which includes evaluation, cooperation with bilateral and multilateral support programs, and information collection.

Pandemic: An epidemic occurring over a very wide area (countries or continents) and usually affecting a large proportion of the population (human and/or animals).

Pathogen / pathogenic agent: The ability of an organism or infectious particle causing serious disease or illness to its host (humans, animals or plants).

Phosgene: Phosgene is a major industrial chemical used to make plastics and pesticides. At room temperature, phosgene is a poisonous gas⁴.

Plague: Plague is caused by Yersinia pestis bacteria. It can be a life-threatening infection if not treated promptly⁵.

Polonium: The chemical element Polonium (Po), atomic number 84, is a silver-gray semi-metal. This highly radioactive element occurs in uranium ores.

Precursor: Any chemical reactant, which takes part in the production of a toxic chemical, is a precursor. The most important precursor is called key component.

Radiation: Radiation is a form of energy. There are two basic types of radiation: ionizing and non-ionizing radiation. The difference between these two types is the amount of energy they have. Ionizing radiation (energy more than 5 eV) has the ability to ionize atoms, which means that electrons could be removed from the atoms. Non-ionizing radiation (energy less than 3 eV), like i.e. UV-light and visible light could not ionize atoms.

Radioactive material: Material containing radioactive isotopes that give off radiation as they decay.

Radioactive source: A radioactive source can be of natural or artificial origin (manufactured source). A manufactured source of radiation is typically used for industrial, research, or medical applications, i.e. Iodine-131(131I) for radioisotope therapy of thyroid cancer, Caesium137 (137Cs) or Cobalt-60 (60Co) for industrial radiography in non destructive testing and inspecting materials for hidden flaws.

Ricin: Toxin extract from plant (castor beans) listed in the Chemical Weapons Convention. Act as a poison.

Riot Control Agent: Riot control agents are compounds that cause temporary incapacitation by irritation of the eyes and irritation of the upper respiratory tract. They are often called irritants, irritating agents, and harassing agents; the general public usually calls them 'tear gas'.

⁴ ["Facts About Phosgene"](#), Centers for Disease Control and Prevention. Accessed on July 1, 2021.

⁵ [Definition for "Plague"](#), Harvard Health Publishing. Accessed on July 1, 2021.

Sarin (GB): An organophosphate CWA (nerve-agent). In pure form clear, colourless and tasteless liquid with Sulphur mustard

Smallpox: A deadly and highly contagious disease caused by Variola major, a double-stranded DNA orthopox virus⁶.

Sulphur mustard: Synonyms: S-Lost, HD, Yperite. Pure sulphur mustards are colourless, viscous liquids at room temperature.

Toxic: Ability to cause injury to living organisms as a result of physicochemical, poisonous interaction.

Toxicity: Toxicity is the degree to which a substance can damage an organism. Toxicity can refer to the effect on a whole organism or on a part of this organism, such as a cell (cytotoxicity) or an organ (organotoxicity).

Toxin: A complex and poisonous organic substance, especially a protein, that is produced naturally by living cells or organisms such as a microbe, animal or plant or synthetically. A Toxin is capable of causing disease when introduced into the body tissues but is often also capable of inducing neutralizing antibodies or antitoxins.

Tularemia: An infectious disease especially of wild rabbits, rodents, some domestic animals, and humans that is caused by a bacterium (*Francisella tularensis*), is transmitted especially by the bites of insects, and in humans is marked by symptoms (such as fever) of toxemia⁷.

Uranium: Uranium (U) is very dense, heavy and silvery-white metal, found naturally as ore in deposits. It is composed of three major isotopes, uranium 238 (more than 99%), uranium 235 (0.72%), and uranium 234 (0.005%). Exposure to uranium can result in both chemical and radiological toxic effects. Chemical toxicity: Uranium is very toxic after ingestion or inhalation, main target organ is the kidney.

Victims: Victims in a CBRN event are exposed to CBRN substances but not necessarily injured.

Viral hemorrhagic fevers: A group of illnesses that are caused by several distinct families of viruses. In general, the term 'viral hemorrhagic fever' is used to describe a severe multisystem syndrome (multisystem in that multiple organ systems in the body are affected). Characteristically, the overall vascular system is damaged, and the body's ability to regulate itself is impaired⁸.

Virus: Living agents capable of reproducing only in a host cell and spreading disease by moving from host to host

VX: The VX nerve agent is the most well-known of the V-series of nerve agents (CWA, Organophosphate).

Weapons of Mass destruction: Weapons of Mass destruction are chemical, biological, nuclear or large explosive munitions with the capacity to kill large numbers of human beings.

⁶ [Factsheet "Smallpox"](#), Federation of American Scientists. Accessed on July 1, 2021.

⁷ [Definition for "Tularemia"](#), Merriam-Webster Online. Accessed on July 1, 2021.

⁸ [Definition for "Viral Hemorrhagic Fevers \(VHFs\)"](#), Centers for Disease Control and Prevention. Accessed on July 1, 2021.

Executive Summary

CBRN functions as an acronym to describe chemical, biological, radiological, and nuclear materials and agents ‘that could harm the society through their accidental or deliberate release, dissemination, or impacts’⁹. The CBRN threat landscape has rapidly evolved in the last few years. Concerning the CBRN threat from state actors, one can identify a trend of weakening of the main regimes against CBRN weapons. In the nuclear domain, there is a trend towards the modernisation of nuclear arsenals for weapon-states and an interest in developing nuclear weapons in some non-weapon-states, in particular Iran and North Korea. Moreover, a treaty that played a key role in non-proliferation - the Intermediate-Range Nuclear Forces (INF) Treaty - has come to an end, which could have significant consequences for European security. The international regime against chemical weapons has been challenged by its repeated violations by Syria, which have remained largely unpunished to date. As for biological weapons, there have been serious doubts as to Russia’s compliance with the Biological and Toxin Weapons Convention (BTWC). This points to a weakening of the norms underpinning these regimes, which has been confirmed by the use of CBRN weapons by some states such as Russia in attempts to assassinate political opponents. These various developments mean that the risk of proliferation – to other state actors or non-state actors – has been increasing.

Regarding the CBRN threat from non-state actors, it is important to note that, whilst there are indications of some of these actors having both intent and a limited capacity to employ such weapons, one must not overblow the CBRN terrorist threat, which is regularly sensationalised in the media and on social media. Overall, the probability of a terrorist attack involving CBRN agents remains low in Europe. This is because of a series of obstacles to obtaining the CBRN agents required for such an endeavour, as well as the hurdles to weaponising them. Amongst the various CBRN weapons available, the use of chemical agents is arguably more likely than that of other agents, whilst the use of nuclear devices appears the least likely, but all the probabilities considered here are low. Taking into account that large-scale terrorist operations involving multiple individuals are more likely to be thwarted by the law enforcement communities and security services, one can argue that, should a CBRN terrorist attack take place, which is an event having a low probability overall, it is unlikely to be on a large scale. More probably, it would be an attack carried out by a lone perpetrator or a very small group of individuals. Nevertheless, even a relatively small attack with a limited number of direct casualties could have a significant impact on society because of the fear and considerable anxiety that it could induce. There could also be major socio-economic disruptions, as transportation networks and businesses could be affected. Moreover, the attack could be instrumentalised by malicious actors who could spread disinformation. This could render the response to the attack, including by first responders, more complicated since, for example, part of the population may not trust the information given by the authorities or may refuse to follow instructions. Some observers argue that the risk of a CBRN attack is likely to increase in future as terrorists may take advantage of emerging technologies, such as drones and the Dark Web. One should not exaggerate the risks associated with such developments, though, as state actors also benefit from these emerging technologies when developing their response to the CBRN threat. Preparedness for and response to CBRN incidents is primarily the prerogative of the European Union (EU) Member States. However, the COVID-19 pandemic has been a reminder that CBRN incidents – whether they result from natural events, accidental releases or hostile uses – can have the potential to overwhelm the response capacities of several, even all EU Member States. They can affect populations across national borders, and they may require international cooperation with external actors. To prepare for such situations, the EU must have robust tools to anticipate, prevent, protect, and respond to CBRN crisis situation and assist EU Member States in a timely and effective manner when necessary.

⁹ European Commission, [CBRN Glossary](#): CBRN.

Given the nature of CBRN incidents, this requires a cross-sectoral (whole of government) approach. No single entity within the EU has the capacity or competence to manage all aspects of an unfolding CBRN incident. Capacities needed to prevent or respond to a CBRN incident reach across many sectors, including security (intelligence, the military, law enforcement and justice), civil defence, public health, environmental protection and remediation, crisis communication and public information. Preparedness for CBRN events also involves other capacities such as strong border and export controls, and calls for engagements with civil society, citizens, and communities such as research and industry. Education is also essential to develop a culture of responsible conduct by actors who are involved with CBRN materials.

The tools available to the EU to prepare for and respond to CBRN incidents are in the hands of EU Member States as well as the Council and the European Commission, the EU's External Action Service, and EU agencies and mechanisms. They include assets belonging to EU Member States, common EU strategies (the most recent one being the EU Security Union Strategy) and policies (in particular the Common Security and Defence Policy (CSDP) and the Common Foreign and Security Policy (CFSP)), a CBRN Action Plan (adopted first in 2009 and after review updated in 2017), and mechanisms and programmes implemented by a variety of Directorate-Generals of the European Commission and EU agencies.

This report provides an overview of these EU response tools. It highlights the existing differences between EU Member States with regard to risk perceptions and levels of preparedness for CBRN events. This is also reflected in differences in the expectation which EU Member States have regarding the role that EU bodies should play in the management of a CBRN crisis. Despite the progress made in implementing the CBRN Action Plan, EU Member States seem reluctant to delegate more authority and competence to the EU in this area. Nonetheless, the COVID-19 experience has demonstrated the utility of a stronger EU coordination role and the use of joint mechanisms, for example by preventing competition between countries and pricing benefits when negotiating contracts for a larger market to procure certain types of equipment. Overall, however, more is needed to increase the EU's preparedness for the next major crisis.

Of the specific tools reviewed in the report, particular attention has been paid to the Permanent Structured Cooperation (PESCO), the EU CBRN Centres of Excellence Initiative, and the Union Civil Protection Mechanism (UCPM). Here, preliminary findings include that progress under PESCO has been slow, with only a few projects having reached initial operational capacity. Among them is the project on a European Medical Command (EMC, merged with the Multinational Medical Coordination Centre as MMCC/EMC), which offers a range of medical capabilities essential for CBRN response. Full operational capacity is expected by the end of 2021. Further, the EU CBRN Centres of Excellence Initiative has the potential of becoming a true EU flagship programme with an effective project delivery approach based on risk and needs assessment in partner countries around the EU. It entails a networking methodology that has shown to be able to create sustainable relationships with partners in a highly sensitive field. To become such a flagship programme, the initiative needs stronger strategic direction and guidance from the European Commission leadership and the External Action Service, effective support from EU Member States and relevant EU DGs with technical competencies in CBRN response, and sustainable financial commitment. As to the UCPM, it supports and complements the prevention and preparedness efforts of participating states, focusing on areas where a joint European approach is more effective than separate national actions. It is a key asset for enhancing EU-wide CBRN threat resistance. An important step towards reaching this goal has been an update to the regulation on the UCPM in April 2021 (Regulation (EU) 2021/836)¹⁰ that allows the European Commission, in cases of urgency, to directly procure emergency capacities in the CBRN field.

The report also reviewed the relationship with the United Nations and related international organisations and agencies, which have received significant EU financial support to implement projects to increase

¹⁰ Regulation (EU) [2021/836](#) of the European Parliament and of the Council of 20 May 2021 amending Decision No 1313/2013/EU on a Union Civil Protection Mechanism EU, OJ L 185/1 26.5.2021, para 3.

universal adherence to international treaties and regimes countering CBRN threats, to strengthen international mechanisms and agencies working in these areas, to develop new tools for verification of treaty compliance and the investigation of CBRN incidents, and to strengthen international cooperation.

The report also discusses the engagements with civil society, the research community and industry. These engagements are important to enhance resilience against CBRN incidents in society and to strengthen the innovation and manufacturing basis for CBRN defence within the EU to reduce dependencies and address vulnerabilities in supply chains for critical equipment and supplies.

The analysis has shown that the complexity of CBRN events and the multitude of possible actors call for a systematic approach to prevention and preparedness, stronger EU-level coordination, and effective coordination with external partners, in particular the US and NATO. It requires an all-hazards, whole of government approach at EU level with strong leadership. After an initially slow response that exposed serious gaps in the preparedness system, the experience of the fight against the COVID-19 pandemic has shown the benefits of such a 'Team Europe' approach.

The report puts forward a number of recommendations on specific issues. The core of the recommendations relates to using a 'Team Europe' approach. This would enable the EU to better support and manage an EU-wide crisis response in the CBRN field in a timely and effective manner. Such a Team-Europe approach requires systematic long-term engagement and investment, as opposed to improvisation. An approach to this end could, for example, take the form of a standing Task Force that is adequately staffed, equipped and resourced to take on an operational role at the very outset of any crisis which may have the potential of affecting the EU as a whole. It could be supported by an EU internal, interdisciplinary Centre of Excellence on CBRN risk mitigation, which could rely on a multilateral, fully operational CBRN response unit, similar to the NATO CBRN defence battalion. Such a system would not only strengthen the response capabilities of the EU but also enable more effective operational cooperation and coordination between EU Member States, and between the EU and external partners such as the US and NATO in particular.

1 Introduction

This Chapter briefly describes the objectives, scope, methodology and structure of the study.

1.1 Objectives and scope

The objective of this study is threefold. First, it provides MEPs (Members of the European Parliament) and interested members of the public with an update on the current threat levels of chemical, biological, radiological and nuclear threats, which are commonly clustered under the acronym 'CBRN'. This includes an update on the state and non-state actors from which such threats might stem. Second, the study assesses the EU's preparedness to deal with these threats by taking stock of the existing preparedness and response mechanisms. These are matched against the updated threat landscape to determine the current state of play of the EU's response tools and any remaining areas for improvement. The third objective of the study is to provide recommendations to improve the EU's preparedness against and response to CBRN threats, which are formulated on the basis of conclusions drawn from the analysis.

In terms of scope, threat actors from within and outside of the EU are considered. The EU's dependencies and existing and potential forms of collaboration with partners are addressed on a global scale. The temporal scope primarily looks at the recent years, considering that the study provides an update on various similar assessments conducted since 2017. Nonetheless, to set the context, historical elements from the early 2000s are also addressed.

1.2 Methodological approach

The study was conducted by a team of experts between April – June 2021. Information was collected through extensive desk research and document review of recently published studies, as well as through thematic interviews and written inputs from practitioners and advisers from a range of backgrounds. These include the European Commission, the European External Action Service (EEAS), North Atlantic Treaty Organisation (NATO), national military, national public health services, medical services, and thematic non-profit organisations¹¹.

1.3 Structure of the study

The report first outlines the context and relevance of the study in **Chapter 2**, followed by a review of themes and recommendations addressed in recent reports on the subject in **Chapter 3**. **Chapter 4** maps the current CBRN threats against the EU and analyses these threats in view of their severity and likelihood of occurring. **Chapter 5** provides an assessment of the EU's level of preparedness to face the identified threats and the response tools available to the EU in the event of an intentional or unintentional CBRN-related incident. **Chapter 6** provides recommendations on reinforcing EU preparedness.

¹¹ See annex II for a list of consulted individuals.

2 Context and relevance of the study

This study was conducted one year into the COVID-19 pandemic, which – as of June 2021 – led to the death of millions of people worldwide and significant legal and financial mitigating measures. Being based on an infectious disease, the COVID-19 pandemic is a prime example of a high-impact biological threat event and may, as such, be considered among CBRN threats. With the scale of the fatalities and measures, such as curfews and the (temporary) curtailing of fundamental rights being felt by people, companies, and countries worldwide, the subject of infectious diseases, pandemics and biological threats gained significant attention. At the same time, the repeated use of chemical weapons during the Syrian civil war regularly made headlines, as did various high-profile poisoning attempts of Russian individuals in the UK and Russia. Likewise, the Iranian nuclear deal was continuously on the political agenda due to shifting foreign policy interests throughout recent US presidencies.

As such, various high-profile cases that may be clustered within CBRN have continuously surfaced in recent years and led to considerations on the level of the EU's preparedness and responses to CBRN threats. For one, this relates to the level of preparedness of the EU and its Member States against natural, accidental or deliberate CBRN threats in the context of the recently gained experiences.

2.1 Background on CBRN

CBRN functions as an acronym to describe chemical, biological, radiological, and nuclear materials and agents 'that could harm the society through their accidental or deliberate release, dissemination, or impacts'¹². The term 'CBRN' goes back to cold war where it was first referred to as ABC (atomic, biological, chemical) and later as NBC (nuclear, biological, chemical). A variation of the current term is CBRNE (also spelt CBRN-E or CBRNe) which incorporates explosive substances or events into CBRN¹³. CBRN threat levels are often inherently linked to the existence of CBRN weapons and the likelihood of their deliberate use by state or non-state actors, to which traditional definitions restrict the term¹⁴. Broader definitions widen the scope of CBRN threats to also 'encompass a wide scope of events, including naturally occurring disasters, accidental incidents at hazardous installations or during the transport of dangerous materials'¹⁵.

Chemical weapons are harmful as a result of the toxic effects produced by chemical reactions¹⁶. One generally distinguishes five classes of chemical weapons. These are irritants, choking or pulmonary agents, blister agents, blood agents and nerve agents¹⁷. The most basic chemical weapons release gaseous or highly volatile chemicals, such as hydrogen cyanide or chlorine gas.

Biological weapons harm their targets by infecting them with natural or deliberately produced toxins or pathogenic micro-organisms, some of which may also be contagious¹⁸. The US National Institute of Allergy and Infectious Diseases (NIAID) has identified the following six biological agents as posing the highest risk to public health and national security: bacillus anthracis (anthrax), clostridium botulinum toxin (botulism), yersinia pestis (plague), variola major (smallpox) and other related poxviruses, Francisella tularensis

¹² European Commission. [CBRN Glossary](#): CBRN.

¹³ European Commission. [CBRN Glossary](#): CBRNE.

¹⁴ European Commission. [CBRN Glossary](#): CBRN.

¹⁵ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p.8.

¹⁶ G.A. Ackerman, 'Chemical, Biological, Radiological and Nuclear (CBRN) Terrorism', in A. Silke, ed. 'Routledge Handbook of Terrorism and Counterterrorism', London: Routledge, 2019, p. 240-252.

¹⁷ B.O. Newsome and J.A. Jarmon, 'A Practical Introduction to Homeland Security and Emergency Management: From Home to Abroad', Thousand Oaks, CA: CQ Press, 2016, p. 174.

¹⁸ G.A. Ackerman, 'Chemical, Biological, Radiological and Nuclear (CBRN) Terrorism'.

(tularemia) and viral hemorrhagic fevers, such as Ebola¹⁹. There has been a concern that biological agents could be sold by or stolen from individuals that have access to state-run programmes.

As for **radiological weapons**, they are harmful to their targets through the radiation emitted by the radioactive material that they contain. It is possible to produce radioactive material – that is, material emitting radiation – through nuclear processes. However, there are also some natural radioactive materials, like potassium, thorium and uranium. Radioactive materials can be used in radiological dispersal devices (RDD), which spread radioactive material (e.g. a 'dirty bomb') or in radiation exposure devices (RED), which can expose persons to harmful doses of radiation whilst being hidden from sight. RDDs are not as destructive as nuclear weapons but can nevertheless have a significant impact, especially in densely populated areas.

Finally, **nuclear weapons** can cause a huge amount of destruction as a result of nuclear reactions – that is, nuclear fission, nuclear fusion, or a combination of both. They can produce mass destruction through radioactive fallout, shock waves and extreme heat. They can also interrupt communications and control systems as a result of electromagnetic pulses, which can cause secondary damage or system failures. Whilst nuclear weapons are potentially the most harmful of all CBRN weapons, they are also the most complex to acquire or develop.

Box 1.1 Recent CBRN cases (accidental as well as intentional)

Recent CBRN cases

- **Syria**, 2012-2018: use of Sarin and Chlorine;
- **United States**, 2013, 2018, 2020: Letters containing Ricin addressed to the White House, the Pentagon, to law enforcement agencies and to other political figures and officials;
- **The Netherlands**, 2014, 2015: Two explosions and a gas leak at a chemical plant (Shell);
- **Spain**, 2015: Chemical incident with a toxic cloud over Igualada;
- **Malaysia/North Korea**, 2017: Assassination of Kim Jong-nam, half-brother of Kim Jong-un at Kuala Lumpur airport using the chemical warfare agent VX;
- **United Kingdom**, 2018: Attempted assassination of Sergei Skripal using Novichok in Salisbury, including the contamination of other members of the public;
- **Germany**, 2018: Foiled bio-terror attack of a couple that planned to build a Ricin bomb.

Outside of specialised circles, CBRN discourse has often been linked primarily to weapons of mass destruction (WMD), i.e. the nuclear element of CBRN in particular. Here, the focus is primarily linked to efforts by countries to manufacture and/or acquire such weapons (e.g. Turkey, Iran), countermeasures to prevent their acquisition and/or production (e.g. the Iran Nuclear Deal), and recently also the ongoing modernisation of nuclear weapons²⁰. This narrative, however, has increasingly diversified and gained short periods of great attention with publicised cases. For one, the Syrian Civil War sparked discourse on the possibility of CBRN agents being deliberately used by terrorists. Other recent cases include the Novichok poisoning of the Russian opposition politician Navalny, which was held to have only been possible 'with

¹⁹ The Hague Centre for Strategic Studies, 'The Increasing Threat of Biological Weapons: Handle with Sufficient and Proportionate Care, The Hague: The Hague Centre for Strategic Studies', 2016, pp. 6-7. The diseases caused by these biological agents are indicated between brackets.

²⁰ SIPRI, '[Global nuclear arsenals grow as states continue to modernize – New SIPRI Yearbook out now](#)', 14 June 2021.

the consent of the [Russian] Presidential Executive Office' by the EU²¹. As mentioned above, the COVID-19 pandemic also drew attention to CBRN, particularly to its biological element.

The threat level of deliberate use of CBRN weapons, accidents and natural occurrence of CBRN agents varies according to a range of factors (see Chapters 4.2 and 4.3). Among others, it depends on:

- Inherent properties of the respective agents' properties;
- Accessibility or ease of acquisition and/or manufacturing²²;
- (Technical) challenges relating to the weaponisation of CBRN agents;
- Challenges relating to the effective deployment of the weapons;
- The context of the attempted malicious use or accidental/natural occurrence;
- The availability and effectiveness of countermeasures.

Likewise, the magnitude of impacts varies from being limited to individuals, individual companies, or localised environments to affecting entire countries, regions and societies, and in the most extreme scenario, international stability.

An important feature of CBRN weapons is that many of the materials that are necessary to build them are of so-called **dual-use**. Dual-use materials can have both military applications, but also civilian applications²³, whereby they may be legitimately used in industry, agriculture, manufacturing and elsewhere in society. The availability of CBRN materials for legitimate purposes provides opportunities for individuals with malicious intent to obtain such materials. At the same time, the manufacturing or legitimate use of CBRN materials may at times lead to accidents, particularly if relevant regulations or their implementation are insufficient (or disregarded).

To counter the creation and potential deployment of CBRN agents and materials as weapons of war, various international conventions, treaties, protocols and bilateral and multilateral agreements exist. These include, *inter alia*, the Chemical Weapons Convention (CWC) of 1993, the 1972 Biological Weapons Convention (BWC) and the 1969 Treaty on the Non-Proliferation of Nuclear Weapons (NPT)²⁴. However, such instruments may come under significant pressure in times of increased political tension or confrontation. These instruments also do not prevent the use by non-signatories, accidental releases or natural CBRN threats. With regard to non-state actors, UN Security Council Resolution 1540 (2004)²⁵ and the subsequent Security Council resolution 2325 (2016)²⁶ have set standards and targets for all states to control CBRN materials and prevent their proliferation to non-state actors. However, progress in implementing the resolutions has been slow.

In this context, effective mitigation measures and adequate preparedness are key to counter the threats emanating from CBRN materials. As both the current and previous pandemics (e.g. the 2009 Swine flu) have shown, CBRN threats are not necessarily confined to regions or countries. The poisoning of Sergei

²¹ Council Decision (CFSP) [2020/1482](#) of 14 October 2020 amending Decision (CFSP) 2018/1544 concerning restrictive measures against the proliferation and use of chemical weapons, OJ L 314/9, 15.10.2020, pp. 5,6,13,14.

²² For state actors, this refers to the availability of necessary materials and production plants. A common example in this regard is the Iranian uranium enrichment process. For non-state actors, this refers to the expertise and means available to converse household products into threat substances, or the level of access to other chosen agents.

²³ European Commission, [CBRN Glossary](#): Dual use-item.

²⁴ [Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction](#) (the Chemical Weapons Convention or CWC); [Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological \(Biological\) and Toxin Weapons and on their Destruction](#); [Treaty on the Non-Proliferation of Nuclear Weapons](#) (NPT).

²⁵ UN Security Council Resolution [1540](#), 2004.

²⁶ UN Security Council Resolution [2325](#), 2016.

Skripal in the UK further demonstrated that CBRN agents might also be transported from one country to another to be deployed there. As such, developments in countries external to the EU are relevant in terms of cooperation efforts and interdependencies related to mitigation, preparedness and response.

2.2 EU competences and activities

The purpose of the following Sections is to provide a short overview of the core aspects of EU competences and EU legislation and key EU initiatives on CBRN. Briefly addressing these aspects at this stage helps to set the scene for the subsequent chapters. However, Chapter 5, in particular, builds on and expands on an analysis of EU initiatives to provide a deeper analysis.

2.2.1 EU Competences

EU Member States hold primary competence for internal security and civil protection, which inherently includes the prevention, detection, and response to CBRN threats. However, it has been increasingly recognised that security matters require the involvement of many actors, as the (in-) security of one country has effects on others. In recognition of this, the Lisbon Treaty provided legal grounds for the EU to engage in the framework of 'shared internal competences (Article 4 TFEU) regarding the area of freedom, security and justice, common safety concerns, and transport; civil protection measures (Article 196 TFEU); as well as external actions of the Union (Articles 21 and 22 TEU)²⁷. Furthermore, in the event of (cross-border) incidents of high magnitude, EU Member States may choose to employ EU (cooperation) instruments in their response. As such, the EU supports EU Member States through the means available within its mandate, such as (judicial) coordination activities, cooperation efforts with actors outside the EU (e.g. via the CBRN Centres of Excellence), or through the monitoring of incidents (e.g. through various Europol reports²⁸).

2.2.2 EU legislation and initiatives

With regard to the detection of, response to and mitigation of CBRN threats, there is **no single piece of overarching EU legislation**. Instead, since CBRN risk management is a cross-cutting, multisectoral and multidisciplinary matter, there is a **complex array of different policies** across different policy domains, wherein CBRN issues are dealt with specifically. For example, Decision 1082/2013/EU addresses the securing of the food chain against CBRN contamination by developing preventive measures, and there are direct links to the 2017 EU Directive on combating terrorism, among others²⁹.

In 2010, the European Commission created the EU CBRN Centres of Excellence (CBRN CoE). The CBRN CoE are a capacity building and cooperation mechanism with third countries on CBRN issues, with a view to mitigating CBRN threats stemming from third countries and promoting best practices. These centres are still in place and are regarded as a successful and useful initiative, among others, by two European Court of Auditor reports in 2014 and 2018³⁰. For more analysis on the CBRN CoE, see Section 5.2.6.

²⁷ Report on strengthening chemical, biological, radiological and nuclear security in the European Union – an EU CBRN Action Plan, European Parliament, [2010/2114\(INI\)](#), 2010, para 1.

²⁸ These include the following: TE-SAT, SOCTA, Annual Activity report, *et cetera*.

²⁹ Directive (EU) [2017/541](#) of the European Parliament and of the Council of 15 March 2017 on combating terrorism and replacing Council Framework Decision 2002/475/JHA and amending Council Decision 2005/671/JHA, OJ L 88, 31.3.2017, p. 6–21; Other policy areas and related policies include: Civil Protection and DG SANCO for Consumer Health Protection (Decision [1082/2013](#)), DGs ENER and MOVE for Energy Infrastructure and Transport Networks (Regulation [347/2013](#) and Decision [661/2010](#), DG TAXUD for Customs (COM(2012) 793 final) DG ENV for Environment and Industrial Risks (Directive [2012/18/EU](#)) and DG DEVCO for International Cooperation, e.g. CBRN Centres of Excellence (DG DEVCO).

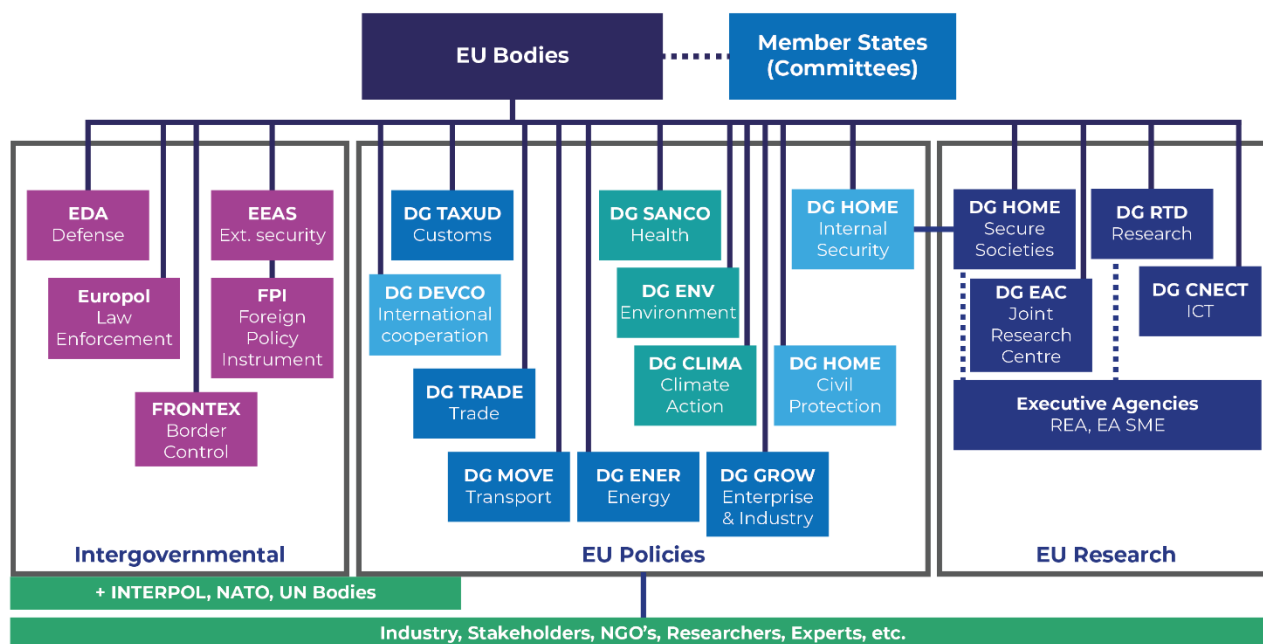
³⁰ European Court of Auditors, [Special Report No.17](#): Can the EU's Centres of Excellence initiative contribute effectively to mitigating chemical, biological, radiological and nuclear risks from outside the EU?, 2014; European Court of Auditors, [Special Report No. 14](#): The EU Chemical, Biological, Radiological and Nuclear Centres of Excellence: more progress needed, 2018.

The EU further adopted **two Action Plans** in 2009 (Strengthening Chemical, Biological, Radiological and Nuclear Security in the European Union – an EU CBRN Action Plan³¹) and 2017 (Action Plan to enhance preparedness against chemical, biological, radiological and nuclear security risks³²). The first Action Plan of 2009 was adopted as a comprehensive roadmap in line with the 2005 European Union Counter-Terrorism Strategy and the 2003 EU Strategy against Proliferation of WMD and their Means of Delivery. It contained 124 different actions and took an all-hazards approach. The second CBRN Action Plan was drafted as part of a broader counterterrorism package set out in Directive (EU) 2017/541³³ in the context of various terror attacks in the EU at the time. The 2017 CBRN Action Plan focused on reducing the accessibility of CBRN materials, ensuring a more robust preparedness for and response to CBRN security incidents, building stronger internal-external links in CBRN security with key regional and international partners, and enhancing knowledge of CBRN risks. It also ‘propose[d], for the first time, that medical preparedness for CBRN attacks [should] be a specific EU priority action and policy commitment’³⁴. For more analysis on the two Action Plans, see Section 5.2.2.

2.2.3 CBRN link to counter-terrorism

In the context of the counter-terrorism perspective on internal security concerns, **DG HOME takes the lead within the European Commission on CBRN matters**. However, CBRN matters are of cross-sectoral and multidisciplinary nature and may thus be considered from various perspectives, including security, health, energy, and more. Accordingly, the work on CBRN issues reaches across many sectors, institutions and DGs of the EU and involves partners in research, development and industry, and links to external actors. The following graph, prepared in the context of the Community of Users (CoU) set up by DG HOME, gives an impression of the underlying complexities:

Figure 0.1 The EU policy landscape with regard to CBRN preparedness and response³⁵



³¹ European Commission, [Communication from the Commission to the European Parliament and the Council on Strengthening Chemical, Biological, Radiological and Nuclear Security in the European Union – an EU CBRN Action Plan](#). COM(2009) 273 final, 2009.

³² 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 final, 2017.

³³ Directive (EU) 2017/541.

³⁴ European Parliament, [‘Member States’ Preparedness for CBRN Threats’](#), 2019, p.19.

³⁵ European Commission, [A Community of Users on Secure, Safe and Resilient Societies \(CoU\)](#). P.22.

The European Commission also funds various projects on CBRN under the police component of the EU's 'Internal Security Fund (ISF)'.

2.2.4 European Parliament

The main resolution issued by the European Parliament on CBRN is the resolution of 14 December 2010 on strengthening chemical, biological, radiological and nuclear security in the European Union (2010/2114(INI)). It aims to ensure a 'smooth interaction of national and European initiatives in addressing CBRN risks' whilst stressing that the 'EU should strengthen its common approach to CBRN prevention, detection and response through the creation of specific mechanisms (regulatory, legislative or non-legislative instruments)'³⁶. Other relevant resolutions by the European Parliament address individual aspects rather than CBRN as a whole, such as Decision No 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC on serious cross-border threats to health, which lays down rules on epidemiological surveillance, monitoring and early warning and combating of severe cross-border threats to health, and Regulation (EU) 2021/836 of the European Parliament and of the Council of 20 May 2021 amending Decision No 1313/2013/EU on a UCPM which addresses the enhancement of the EU's response capabilities to crises.

In recent years, various discussions on a wide range of CBRN topics have also taken place in the European Parliament. Since 2018, **six prominent debates and one workshop** have taken place, most of which are focused on the broader topic of chemical weapons and their recent use. Resulting in the adoption of a resolution³⁷ on the situation in Syria, a wider debate took place in Parliament on 17 April 2018³⁸, wherein the use of chemical weapons and attacks in the region was discussed among MEPs. Broadening the context of chemical weapons as used by state and non-state actors, a workshop titled 'EU preparedness against CBRN weapons' took place at the European Parliament (EP) on November 19, 2018³⁹. In reference to various recent attacks, including the Syrian conflict, the 2018 Novichok attacks in Salisbury, and the disruption of two ricine terror plots in Germany and France that same year, MEPs and experts discussed the use of EU mechanisms and EU Member States' military assets as possibilities for strengthening prevention capacities. In September 2020, the topic of chemical weapons was again discussed by the EP during a plenary session and subsequent resolution on the poisoning of Alexei Navalny, a prominent Russian political and social activist⁴⁰. On 15 April 2021, members of the EP's Subcommittee on Security and Defence (SEDE) welcomed the Director-General of the Organisation for the Prohibition of Chemical Weapons (OPCW), Fernando Arias, to a 'discussion on possible ways to contain the spread and use of chemical weapons inside and outside of the military domain and to bring the countries violating the provisions of the CWC, back to full compliance'⁴¹. Debates and discussions on other CBRN topics in Parliament continued in recent years. For example, at the 2020 Review Conference, held on 20-21 October 2020, MEPs reiterated their support for the NPT⁴². Further, in a discussion on 15 March 2021, members of the Environment, Public Health and Food Safety (ENVI) Committee questioned representatives from the European Medicines Agency (EMA), the European Centre for Disease Prevention and Control (ECDC) and the World Health Organisation (WHO) on

³⁶ European Parliament, Strengthening Chemical, Biological, Radiological and Nuclear Security in the European Union - an EU CBRN Action Plan European Parliament resolution of 14 December 2010 on strengthening chemical, biological, radiological and nuclear security in the European Union – an EU CBRN Action Plan ([2010/2114\(INI\)](#)), OJ CE 169/8, 15.6.2012.

³⁷ European Parliament Resolution of 15 March 2018 on the situation in Syria ([2018/2626\(RSP\)](#)).

³⁸ European Parliament Debates [Tuesday, 17 April 2018](#) – Strasbourg.

³⁹ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019.

⁴⁰ European Parliament resolution on the situation in Russia: the poisoning of Alexei Navalny ([2020/2777\(RSP\)](#)), 14.9.2020.

⁴¹ IEU Monitoring, EP Debate with the Organisation for the Prohibition of Chemical Weapons (OPCW) – Subcommittee on Security and Defence [webpage](#), April 2021.

⁴² European Parliament [Briefing](#), MEPs to reiterate support for Treaty on Non-Proliferation of Nuclear Weapons, 15.10.2020.

the efficacy of vaccines against mutations of the COVID-19 virus⁴³. An overview of relevant discussions in the EP can be found in **Annex III**.

The European Parliament also commissioned **various studies** in recent years with a focus on CBRN-related topics. An overview of a selection of recent studies alongside the committees which requested the study can be found in **Annex IV**.

2.3 Relevant geopolitical context

CBRN threats occur in and are subject to a volatile international context of constantly evolving geopolitical developments. In this regard, recent studies regularly refer to an 'increasingly challenging security environment, with a climate of international instability and a level of tension not seen since the end of the Cold War'⁴⁴. Third-country partners remain vital for the EU in tackling and mitigating CBRN threats, but at the same time, they might also pose risks to the EU. This Section provides an overview of geopolitical developments that are not threat-specific but nonetheless relevant to the overall goal of the study. Some of the elements addressed in the following Sections are also covered in more detail in the following Chapters.

2.3.1 Revival of US multilateralism

Soon after the 2020 presidential elections in the United States (US), a renewed US interest in multilateralism and enhanced transatlantic became observable. While this had been scaled down significantly during the years of the Trump presidency, the returned interest observable since President Joseph Biden took office has not reached pre-Trump levels⁴⁵ and retains elements of the 'America first' policy⁴⁶. In terms of large cross-border issues, the new Biden Administration particularly focuses on climate change (Paris Agreement), nuclear weapons, the defence of democracy, and global health. Of these, the nuclear weapons and global health aspects have direct effects on the international context of combatting CBRN threats. Early actions of president Biden already addressed the revival of US non-proliferation efforts and arms control. In this regard, president Biden agreed to extend the New START treaty⁴⁷, and expressed interest in bringing an updated version of the Iran Nuclear deal back to life⁴⁸. In terms of biological threats and global health concerns, the Biden administration also decided to re-join WHO.

2.3.2 Growing foreign assertiveness

A second relevant geopolitical development is the ongoing and growing assertiveness of the foreign and defence policies of some third powers. This assertiveness translates into increasingly overt and direct tactics in pursuit of the countries' foreign and defence policy goals over the past years. This results in actions that cross the conventional lines of state sovereignty and defy peaceful bi-/multilateral relations. Main actors in this regard include countries such as China, North Korea and Russia⁴⁹. This assertiveness leads to increased threats both inside and outside of the borders of Europe, also in the CBRN domain. Examples relating to CBRN threats on European soil are the 2018 poisoning of the former Russian double agent Sergei Skripal and his daughter Yulia, using Novichok, a chemical nerve agent allegedly carried out by Russian agents who had travelled to the UK for this purpose. This was not an isolated incident as earlier in 2006, Alexander Litvinenko was also poisoned in the UK, though with polonium-210, which caused

⁴³ European Parliament [press release](#), COVID-19 vaccines: MEPs to debate concerns about virus mutation, 12.03.2021.

⁴⁴ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019.

⁴⁵ S. Patrick, '[The Biden administration and the future of multilateralism](#)', Raisna Debates: Observer Research Foundation, 2021.

⁴⁶ A. Dworkin, '[Americans before allies: Biden's limited multilateralism](#)', European Council on Foreign Relations, 2021.

⁴⁷ The New START treaty is the successor of the 1991 Strategic Arms Reduction Treaty, which is meant to reduce nuclear arms and intercontinental ballistic missiles both in the Russian and American war arsenal. See: D.M. Herszenhorn, '[Putin and Biden confirm extension of New START treaty](#)', Politico, 2021.

⁴⁸ S. Erlanger and D.E. Sanger (NYTimes), '[U.S. and Iran Want to Restore the Nuclear Deal. They Disagree Deeply on What That Means, 2021](#)'.

⁴⁹ S. De Spiegeleire et al., Assessing Assertions of Assertiveness. Are China and Russia Really Becoming More Assertive?, 2014.

acute radiation syndrome and led to his death. Outside of the EU borders, one could think about the growing overt assertiveness of third countries in the form of the North Korean and Iranian nuclear aspirations and the accompanying capacity building and research.

2.3.3 Instability in the Middle East

The situation in the Middle East remains tense. The latest eruption of violent conflict in in Palestine and Israel, a country with nuclear capabilities, in spring 2021 exemplifies the region's flammable geopolitical constellation. However, this is not the region's only instability. In Syria, the world has seen the use of mustard agents, chlorine gas and the nerve agent Sarin during the civil war. Between 2013 and 2018, both the Syrian government of Bashar al-Assad and the terrorist group ISIL deployed chemical weapons against citizens. Estimates on the number of attacks per perpetrator vary. According to various sources, 98% of the attacks were carried out by the Assad regime, while ISIL carried out about 2%⁵⁰. Parts of Syria are still occupied and in a state of unrest and turmoil. This will be addressed in more detail in Section 4.2.

In addition to these regional instabilities, no new nuclear deal has been reached with Iran since the US refused to ratify the JCPOA (Joint Comprehensive Plan of Action, also commonly referred to as Iran Nuclear Deal) in 2017 and subsequently withdrew in 2018. This left Iran largely unchecked in its nuclear aspirations. However, the new Biden administration is working towards a new nuclear deal with Iran, whereby some indirect talks have already taken place⁵¹. This will be addressed in more detail in Section 4.2.

2.3.4 Brexit

While the UK was still part of the EU, it had regularly shown resistance towards further integration of defence capabilities in the EU and the EU's CSDP in general. In the context of various changes to the geopolitical landscape, such as civil wars in Libya and Syria, the rise of ISIL, the annexation of Crimea, and several terror attacks in Europe between 2015-2017, renewed focus was placed on European security and defence cooperation. An observable change following the 2016 referendum was that the UK increasingly withdrew from blocking initiatives aimed at greater European security and defence cooperation. As a consequence, the launch of PESCO within the CSDP took place in 2017⁵².

In terms of security partnerships that had already been in place pre-Brexit, several other practical changes ensued. These are particularly related to law enforcement and intelligence cooperation, considering that security and defence issues are not part of the trade and cooperation agreement concluded in December 2020. As such, there is currently no formal framework for cooperation in these areas between the EU and the UK outside of NATO, even though discussions are taking place to agree on a new framework for cooperation. As this also concerns cooperation on counter-terrorism and cross-border organised crime cases, among others, there are consequently implications for cases involving the potential use of CBRN agents or the exploitation of related weaknesses are dealt with. For law enforcement and intelligence cooperation, EU data protection laws are crucial as they govern information exchange, particularly in terms of sensitive data. These laws fall under the jurisdiction of the Court of Justice of the European Union (CJEU), to which the UK refused to be bound following the end of the transition period. Consequently, intelligence exchanges are likely to be more limited in the future, and cooperation might shift to more bilateral

⁵⁰ T. Schneider and T. Lütkefend, '[Nowhere to Hide: The Logic of Chemical Weapons Use in Syria](#)', 2019; Human Rights Watch, '[Death by Chemicals: The Syrian Government's Widespread and Systematic Use of Chemical Weapons](#)', 2017; D. Kimball and K. Davenport, '[Timeline of Syrian Chemical Weapons Activity, 2012-2021](#)'. Arms Control Association, 2021.

⁵¹ L. Jakes and F. Fassihi, '[Nuclear Talks With Iran Could Reach Agreement Within Weeks, U.S. Says](#)'. NYTimes, 2021.

⁵² PESCO website, [About PESCO](#).

channels⁵³. In terms of judicial cooperation related to cross-border cases, provisions were made in the Withdrawal Agreement allowing for the continuation of ongoing judicial cooperation proceedings⁵⁴.

In terms of post-Brexit provisions relating to the individual C, B, R, and N elements, changes to the legal landscape affect the UK particularly. For one, following the end of the Brexit transition period, the EU Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals, i.e. the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (Reg (EC) No 1907/2006)⁵⁵ ceased to have effect in Great Britain but continues to apply in Northern Ireland⁵⁶. This means that the intrinsic properties, potential risks and hazards of chemical substances produced in the UK are no longer registered with the European Chemicals Agency's (ECHA) REACH database⁵⁷. In terms of biosecurity, all EU biosecurity legislation was transposed into the UK's domestic law using powers under the European Union (Withdrawal) Act 2018. It remains to be seen how developments in this area continue, e.g. in terms of checks on imports and exports and risk monitoring mechanisms as rules are likely to diverge over time. Further, the EU-UK Agreement for cooperation on the safe and peaceful uses of nuclear energy (the Agreement) was negotiated during the transition period and is provisionally applicable since 1 January 2021⁵⁸. It includes provisions on compliance with international non-proliferation obligations and the upholding of a high level of nuclear safety standards. It also enables trade and commercial cooperation relating to the nuclear fuel cycle, cooperation in the safe management of spent fuel and radioactive waste, supply and transfer of (non-)nuclear material, technology and equipment, and more. The Agreement also entails provisions on continued cooperation in the European Community Urgent Radiological Information Exchange (ECURIE) and the European Radiological Data Exchange Platform (EURDEP). In the event of nuclear incidents, this will make early notification and reliable radiological information available to EU Member States and the UK. It also allows for real-time data sharing to facilitate rapid, coordinated responses to radiological emergencies⁵⁹.

2.4 COVID-19

The COVID-19 pandemic unfolded based on an infectious disease and is, as such, a biological health crisis. Consequently, it is a CBRN event. The scale of the COVID-19 pandemic directed immense attention to the possible social, political and economic effects of a CBRN crisis in general and on biological/health emergencies and civil protection mechanisms in particular. With the impact being felt by nearly every individual around the world, this attention came independent of the pandemic's origin. In providing

⁵³ In February 2021, the European Commission launched a process on personal data flows to the UK on the basis of 'adequate level of protection' measures. Here, if a non-EU country has been found to have adequate, i.e. essentially equivalent levels of data protection as comparable to the EU, transfer of personal data might be granted. An interim period, during which data flows between the UK and the European Economic Area (EEA) continued, will expire on 30 June 2021. See: European Commission, [Data protection: European Commission launches process on personal data flows to UK, 2021](#). Further, the EU-UK Trade and Partnership Agreement already included provisions that allowed for the initiation of operation cooperation between Europol and the competent authorities of the UK as third state at the start of 2021. While relevant provisions are still in the process of being implemented, additional data protection safeguards are in place. See: Europol [Conditions applicable to the cooperation with the UK since 1 January 2021, 2021](#).

⁵⁴ For proceedings initiated after the end of the transition period, there is evidence of interest in the continuation of operational continuity, such as through the appointment of a British Liaison Prosecutor at Eurojust since 1 January 2021, and provisions in the Trade and Cooperation agreement (TCA) on, among others, surrender, freezing and confiscation, mutual legal assistance, and exchange of criminal records. See: Eurojust, [Practical guidance for judicial practitioners on cooperation with the United Kingdom, 2021](#).

⁵⁵ [Amendments to the annexes](#) were made in 2018.

⁵⁶ [The REACH](#) etc. (Amendment etc.) (EU Exit) Regulations 2020.

⁵⁷ This also means that the UK is also no longer able to access this database due to restrictions on data sharing, and that new rules apply within the UK. For more information see: [UK Parliament, Research Briefing: End of Brexit transition: chemicals regulation \(REACH\), 2021](#).

⁵⁸ European Commission, [The EU-UK Agreement for cooperation on the safe and peaceful uses of nuclear energy](#), 2021.

⁵⁹ European Commission. [The EU-UK Agreement for cooperation on the safe and peaceful uses of nuclear energy](#), 2021.

sudden and extreme attention to CBRN threats, the pandemic unveiled various points of concern beyond managing the health crisis at hand.

The pandemic **exposed weaknesses and vulnerabilities** in EU Member States and EU prevention and response preparedness and capacities to address large-scale civil protection emergencies. For one, this relates to the experience of shortages in national response capacities, such as Personal Protective Equipment (PPE), testing equipment and hospital capacities. It also highlighted the necessity for smooth and effective assistance between EU Member States. Hence, the pandemic highlighted a need to build on these experiences and improve preparedness and increase capacities for any future natural, accidental or malicious unfolding of CBRN threats. The pandemic, alongside the previously mentioned high-profile poisoning cases and nuclear weapons proliferation efforts, has contributed to providing momentum to renew attention on the protection against CBRN threats. The first direct actions initiated as a direct consequence of the pandemic include the recent efforts to strengthen the EU's response capacity through its UPCM. For this, Decision (2019/420) was passed, as well as a preliminary agreement in February 2021. According to these, the European Commission may acquire additional resources for crisis response directly under rescEU for internal and external deployment. To facilitate this, the budget of rescEU was expanded under the new Multiannual Financial Framework (MFF)⁶⁰.

The effects of the pandemic and varying approaches to responding to it have also seen crises unfolding and instability risks rising in many third countries. As is often the case, crises and conflict in third countries might, after a while, lead to challenges closer to home. The pandemic highlights the continuing need to engage with and support third countries preventatively, rather than focusing on internal challenges exclusively.

Concerns have also arisen regarding a **potential resurgence in interest of malicious actors** in terms of their use of CBRN agents in potential plots, considering that the pandemic showcased their immense possible effects⁶¹. At the same time, it has been noted that the COVID-19 pandemic has also influenced far-right extremists' propaganda. This propaganda builds on **COVID-19 related conspiracy theories and has already inspired plots and attacks**, albeit not involving the use of CBRN material⁶². Additionally, **Islamist extremist propaganda has also adapted to the COVID-19 pandemic in that it has focused on the vulnerability of governments during the COVID-19 pandemic** and pointed out that the level of distraction of governments poses an opportunity for attacks.

Further, the pandemic highlighted and, to some extent, reinforced and accelerated strategic trends and points of concern, such as risks related to being too dependent on individual countries and to experience divisions fostered through hostile efforts of third countries. It has also been noted how the pandemic 'questions an overly narrow understanding of what security and defence are about and shows how interconnected and interdependent (for better or for worse) civilian and military sectors are in times of genuine crises'⁶³.

Other effects of the management of the pandemic have led to vulnerabilities beyond those highlighted regarding response mechanisms, such as increased working from home and consequently more opportunities for cyberattacks. Although there have been no large-scale physical attacks within the EU during the time of the pandemic, there have been numerous cyber incidents by criminals and – it is assumed – state actors.

⁶⁰ European Parliament, '[COVID-19 lessons learnt: boosting EU civil protection](#)', 2021.

⁶¹ A. Silke, '[COVID-19 and terrorism: assessing the short- and long-term impacts](#)', Pool Re, 2020; A. Brzozowski, '[Has COVID-19 increased the threat of bioterrorism in Europe?](#)', Euractiv, 2020.

⁶² A. Silke, '[COVID-19 and terrorism: assessing the short- and long-term impacts](#)', Pool Re, 2020.

⁶³ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020.

3 Findings of recent studies

This Chapter looks into studies, briefings, in-depth analyses and workshop reports which have been produced for various committees of the European Parliament on CBRN-related themes since 2018.

3.1 Topics discussed in previous studies and reports

3.1.1 Focus on types of CBRN threats and threat actors

The type of CBRN threat particularly addressed in recent studies varies according to the context of the drafting of the respective studies. Outlines either follow existing, well-known cases or discuss hypothetical threats. The focus is mostly placed on the (potential) malicious use of CBRN materials and agents, with natural occurrences – at least until COVID-19 – and accidental uses being addressed less frequently or only in very specific contexts, such as the Fukushima nuclear accident.

For one, the context is often set through references to examples of occurrences of CBRN threats, as well as to relevant recent policy developments. Recent studies from mid-2020 onwards, i.e. from during the COVID-19 pandemic, accordingly focus, particularly on biological threats⁶⁴. Other previous studies on CBRN make frequent reference to chemical threats based on the context of frequent chemical attacks of the past decade, including during the Civil War in Syria, in Salisbury⁶⁵, and the foiled terror plots involving ricin in France and Germany in 2018. Nuclear threats are mentioned in the framework of developments surrounding the Iranian and North Korean nuclear programmes, but also in terms of cross-border nuclear safety and liability and insurance concerns related to nuclear accidents⁶⁶. Radiological threats are only considered to a very limited extent.

Reference to threat actors depends on the type of threat particularly addressed. Only a few States are directly referred to. Nonetheless, across various European Parliament publications, state actors, such as the Syrian regime, Russia and North Korea, are mentioned in the framework of chemical attacks in Syria and several assassination attempts using nerve agents in the United Kingdom, Russia, North Korea, and Russia⁶⁷. Non-state actors who are referred to include the Islamic State in relation to their use of chemical agents during the Syrian civil war and potential experimentations with biological weapons, but also include cases of individuals attempting chemical attacks in Europe, and whether the threat of non-state actors conducting CBRN threats continues.

3.1.2 EU Member States' preparedness

A 2018 study commissioned for the Special Committee on Terrorism (TERR) on EU Member States' Preparedness for CBRN threats offers an analysis of the state of Member State preparedness for CBRN incidents and ways to improve this preparedness⁶⁸. It builds on the baseline that the primary responsibility to protect citizens from public health and CBRN threats lies with each individual Member State. According to the study, EU Member States have different views and perceptions on the CBRN threats and, therefore, also **different levels of preparedness**. The authors note that there does not seem to be an adequate and/or linear link between preparedness and threat level of selected EU Member States. Overall, the authors suggest that there is **room for improvement** at EU Member State level.

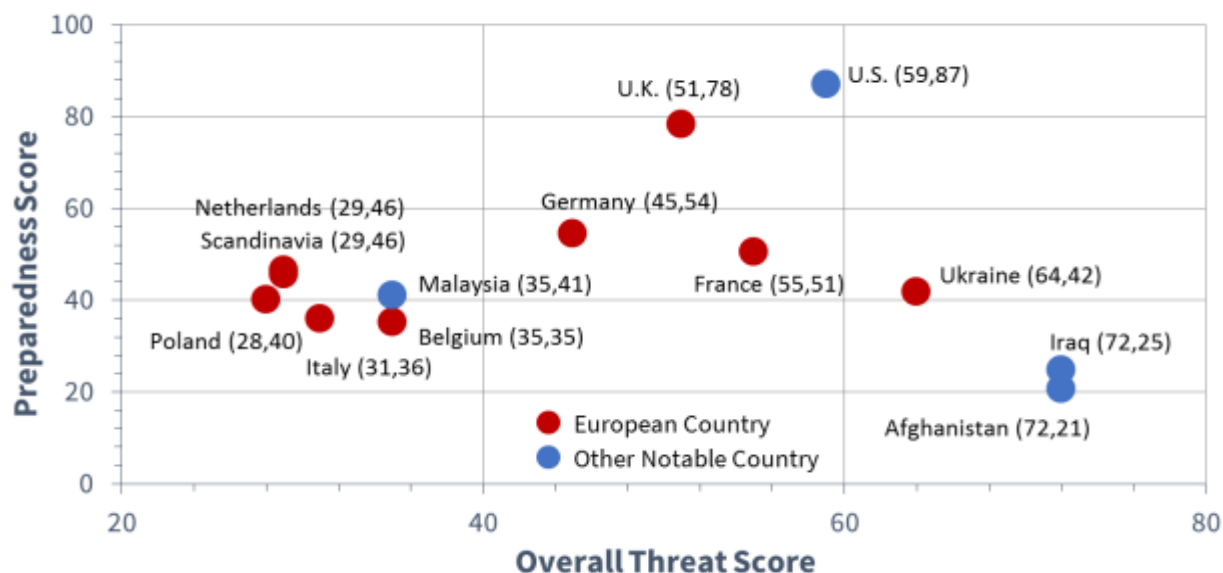
⁶⁴ E.g. European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020.

⁶⁵ E.g. European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018.

⁶⁶ European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019.

⁶⁷ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p. 16.

⁶⁸ European Parliament, '[Member States' Preparedness for CBRN Threats](#)', 2019.

Figure 0.2 Threat and preparedness scores in selected countries and regions⁶⁹

In terms of the **availability of medical and protective supplies**, many EU Member States rely on being able to obtain medical countermeasures from the US through sharing agreements via the global Health Security Initiative (GHSI). This poses a risk to the security of supply and to distribution challenges when countermeasures are needed immediately⁷⁰. As is shown in Section 3.2 below, this leads to recommendations relating to the establishment of central or regional stockpiles of specialist countermeasures and equipment ahead of incidents occurring.

Gaps were also noted in the **ability to treat victims** of chemical and biological attacks with the most appropriate countermeasures, and that first responders, such as ambulance, fire and police services, are not adequately protected with respect to vaccines and therapeutics against chemical, biological and radiological attacks. This is also reiterated in a 2020 briefing on how the COVID-19 crisis has affected security and defence-related aspects for the EU, which addresses the need to minimise the risk of infection for staff from exposure to biological CBRN material⁷¹.

Furthermore, a 2019 study on **cross-border nuclear safety and related liability and insurance** schemes highlight that more attention should be placed on nuclear safety to reduce the likelihood of nuclear accidents occurring within the EU. It points out that 'so far, [...] nuclear safety has often been based on rather vague principles and standards, often also relying on the expertise within industry. It is important, also with a view on public confidence, that more precise, legally enforceable rules are worked out⁷²'. The report critiques the lack of powers at EU level to inspect or monitor nuclear power plants, as the implementation and enforcement of the nuclear safety regulation lies with EU Member States⁷³. It also addresses a revision of international conventions with a view to adjusting compensation levels to victims of nuclear accidents⁷⁴ and notes tendencies towards more transparency and public accountability in the nuclear area as a whole⁷⁵.

⁶⁹ European Parliament, '[Member States' Preparedness for CBRN Threats](#)', 2019, p. 20, from: Booz Allen Hamilton, 'The CBRNE Threat and Preparedness Landscape in Europe', 2017.

⁷⁰ European Parliament, '[Member States' Preparedness for CBRN Threats](#)', 2019, p. 30.

⁷¹ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p.13.

⁷² European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019, p.133.

⁷³ European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019, p.11.

⁷⁴ European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019, p.133.

⁷⁵ European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019, p.11.

3.1.3 EU Support to EU Member States

Even though the mandate for the prevention, detection and response to CBRN threats lies with EU Member States, various initiatives have been taken at the EU level to strengthen preparedness and response against CBRN attacks. Reports build on the effectiveness of existing relevant mechanisms⁷⁶ and on possibilities for future avenues of EU response to CBRN threats⁷⁷.

For one, the **EU Civil Protection Mechanism (UCPM)** was evaluated in 2018 in a report for the TERR committee with reference to major terrorist attacks involving CBRN⁷⁸. The UCPM is a cornerstone of the EU response system, which includes a voluntary pool of assets pre-committed by EU Member States for immediate deployment, the European Emergency Response Capacity (EERC). A solidarity clause enables it to act as a crisis management centre⁷⁹. Overall, it was assessed to be an effective crisis management tool, which is still evolving and until 2018 had been activated around 300 times to respond to natural and human-made disasters within and outside of the EU⁸⁰. In terms of the UCPM's value related to potential terrorist attacks involving CBRN materials or agents, however, the effectiveness of the UCPM could not be established, as no such case existed at the time of review⁸¹. Nonetheless, several weaknesses of the UCPM relating to potential CBRN terrorist attacks were pointed out, such as being limited to in terms of activity should a terrorist attack involving CBRN occur and being excluded from relevant decision-making processes. Further, should innovative offensive tactics and strategies be employed by terrorists, the UCPM was held not to be ready to deal with them. More positively, however, the report noted that the UCPM training programme had been improved by including specific CBRN components. Likewise, a 2020 report on cross-border threats to public health indicated that the 2019 strengthening of the UCPM through the rescEU reserve foresaw the goal of adding means over time to be able to respond to various events, including CBRN hazards⁸². The UCPM was ultimately activated many times in the context of COVID-19, e.g. to repatriate citizens⁸³, provide PPE or deploy medical teams⁸⁴.

Other preparedness actions in this regard include the signing of framework contracts for the joint procurement of pandemic influenza vaccines and beyond in early 2019⁸⁵. Furthermore, a joint action on strengthened International Health Regulations and preparedness in the EU (SHARP JA) was launched shortly before the beginning of the COVID-19 pandemic, which particularly focuses on countering 'biological and chemical terror attacks in Europe across the health, security and civil protection sectors'⁸⁶ in the timeframe 2019-2022. In this regard, it was held that European added value is clearly achieved in 'the facilitation of synchronised responses to pandemics/epidemics and simplification of the response to safety issues, as well as reduction of cross-border threats'⁸⁷.

The **Joint Procurement Mechanism (JPM)** was also addressed in relation to preparedness for CBRN threats unfolding. The JPM aims at securing more equitable access to specific medical countermeasures,

⁷⁶ E.g. European Parliament, '[Cross-border nuclear safety, liability and cooperation in the European Union](#)', 2019; European Parliament, '[The benefit of EU action in health policy: The record to date](#)', 2019; European Parliament, '[Briefing: Regulation 98/2013 on the marketing and use of explosives precursors: Implementation Appraisal](#)', 2018.

⁷⁷ E.g. European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, European Parliament, '[The role of armed forces in the fight against pandemics](#)', 2020.

⁷⁸ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018.

⁷⁹ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018, p.16.

⁸⁰ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018, p.4.

⁸¹ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018, p.4.

⁸² European Parliament, '[Cross-border threats to health: EU action on preparedness and response](#)', 2020, p. 4.

⁸³ European Commission, '[Coronavirus: EU Civil Protection Mechanism activated for the repatriation of EU citizens](#)', 28.01.2020.

⁸⁴ European Commission, '[Coronavirus response: Crisis management and solidarity](#)'.

⁸⁵ European Parliament, '[Cross-border threats to health: EU action on preparedness and response](#)', 2020, p. 9.

⁸⁶ European Parliament, '[Cross-border threats to health: EU action on preparedness and response](#)', 2020.

⁸⁷ European Parliament, '[The benefit of EU action in health policy: The record to date](#)', 2019, p. I.

whereby EU Member States can jointly procure pandemic vaccines and other medicines and equipment through a centralised procedure. However, it has been criticised in terms of its practical use, as this has proven to be complicated. While DG SANTE takes the lead on identifying and negotiating terms for products as requested by EU Member States, separate contracts are still required between suppliers and the individual EU Member States. Also, EU Member States, which signed up to the JPM, still procure separately from the mechanism⁸⁸. As of April 2020, the JPA has been signed by 37 countries⁸⁹.

Preventative actions are also established through **EU regulations** targeting specific types of CBRN threats. A briefing was produced reviewing the implementation of Regulation 98/2013 on the marketing and use of explosives precursors until 2018. Explosives precursors refer to specific dual-use chemical substances that have legitimate applications but can be (and have been) misused to manufacture homemade explosives (HMEs)⁹⁰. The regulation – which was subsequently repealed and replaced by a new one in 2019⁹¹ – aimed at reducing the risk of misuse while balancing the free movement of explosive precursor substances throughout the internal market. The briefing's findings indicated that there were significant challenges observable related to the application of the regulation⁹².

A 2020 briefing⁹³ addresses **CSDP missions** and assistance in health emergencies. During the COVID-19 pandemic, all missions and operations had attempted to provide assistance to their host countries related to the management and fall-out of the pandemic, such as the donation of equipment and the sharing of advice. It was noted that this was done despite an absence of a humanitarian aid mandate. Based on this, the briefing asks an open question of 'whether missions and operations should be explicitly mandated and equipped to play a more forceful role in helping civil authorities deal with pandemics and potentially other health emergencies. Should the EU adopt a new approach to health diplomacy with all its risks and opportunities⁹⁴?' Related to this, the 2020 briefing called for adjustments, particularly to civilian missions, which should be made to maintain operational effectiveness, considering frequent delays in the agreement and deployment of missions and operations and a general lack of preparedness of CSDP missions⁹⁵.

In terms of security and defence, it has been noted that 'the EU is in the process of strengthening its capacities in the field of security and defence'⁹⁶, in line with its aim for strategic autonomy. In this context, a 2019 workshop report on EU preparedness against CBRN weapons signalled a favourable context for the **strengthening of EU military capabilities** in the CBRN field and proposed to further explore the role of the military on the European level. It was suggested that a possible first step to this end could be to ensure

⁸⁸ European Parliament, '[Member States' Preparedness for CBRN Threats](#)', 2019, p. 34.

⁸⁹ These include all EU Member States and EEA-countries, the UK, Albania, Montenegro, North-Macedonia, Serbia and Bosnia and Herzegovina as well as Kosovo. See: European Commission, Preparedness and response planning [website](#).

⁹⁰ European Parliament, [briefing](#): Regulation 98/2013 on the marketing and use of explosives precursors: Implementation Appraisal, 2018.

⁹¹ European Parliament legislative resolution of 16 April 2019 on the proposal for a regulation of the European Parliament and of the Council on the marketing and use of explosives precursors, amending Annex XVII to Regulation (EC) No 1907/2006 and repealing Regulation (EU) No 98/2013 on the marketing and use of explosives precursors (COM(2018)0209 – C8-0151/2018 – [2018/0103\(COD\)](#)).

⁹² These include: fragmented landscape of restrictions and controls across Member States; insufficient awareness along the supply chain about rules and obligations arising from the regulation; a lack of clarity about certain provisions that focus particularly on the identification of products that fall within the scope of the regulation and the identification of legitimate/professional users; a lack of clarity as to the application of the regulation to online marketplaces (due to the absence of an explicit reference to e-commerce in the regulation); non-inclusion of all threat substances in the list of restricted explosives precursors; and the perceived inflexibility of the procedure for adding new threat substances to the list. From: European Parliament, '[Briefing: Regulation 98/2013 on the marketing and use of explosives precursors: Implementation Appraisal](#)', 2018.

⁹³ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020.

⁹⁴ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p. 13.

⁹⁵ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p. 13-14.

⁹⁶ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p.9.

the development of a common framework for CBRN incidents⁹⁷. After the on-set of the COVID-19 pandemic, a subsequent briefing sought to explore the role of the military in pandemics, considering the ability of military forces to mobilise quickly in crisis situations and experience with public health crises gained through military exercises⁹⁸. It was noted that ‘armed forces have been among the first responders [during the COVID-19 pandemic] in almost all [EU] Member States’⁹⁹, thereby demonstrating their added value.

3.1.4 Learning from COVID-19

As indicated previously, the most recent studies published on CBRN concern COVID-19 and its overall impact. Emphasis is placed on learning from crises, as **‘much of the impact of the crisis depends on whether the right lessons are learned from it’**¹⁰⁰. As such, it was recommended to determine which of the changes that took place during the pandemic are **short-term and which are long-term**, to target post-pandemic policies accordingly. For example, it has been noted that COVID-19 led to the reinforcement and acceleration of trends at the strategic level, such as the risks of dependencies and internal divisions fuelled by outside forces. Establishing which of these and other trends will manifest themselves after the pandemic will be crucial in adapting policies and approaches to changing international, political and institutional landscapes in the post-COVID-19 world. This also includes changes that took place within the EU during the pandemic, such as novel cooperation mechanisms, such as the procurement of vaccines by the European Commission on behalf of EU Member States, which, along with other aspects that have been influenced by the pandemic, will be addressed in Chapter 5. The same holds true in relation to another core recommendation issued in the context of learning from COVID-19, namely to **take stock of which approaches to the crisis response worked well and what did not go well**. For one, preliminary conclusions offered by the studies in this regard include that a late crisis response results in higher costs and that there are benefits in following an approach building on prevention, preparedness, and resilience¹⁰¹. Since the scale of the pandemic inherently led to immense awareness and interest in a large variety of relevant aspects, a continuous influx of studies on COVID-19 and particularly relating to the crisis response are already contributing to the implementation of such recommendations, considering that such research builds up a pool of knowledge from which relevant authorities and organisations can draw lessons. At the same time, as briefly indicated in Section 2.4, an early lesson learned from COVID-19 related to the need to strengthen the EU’s response capacity through the UPCM. Action was swiftly taken through the passing of Decision (2019/420) and a preliminary agreement, which enables the European Commission to acquire additional resources for crisis response directly under the expanded rescEU fund to support crisis responses.

A specific recommendation related to learning from crises offered in a briefing on the subject holds that the EU and EU Member States should **consider opening public inquiries** into the handling of the crisis to identify and learn the most appropriate lessons about the threat from natural and human-made pandemics. As the pandemic is still ongoing at the time of the publication of this report, it is too early to say how many EU Member States will conduct such public inquiries while one is being planned in the UK

⁹⁷ European Parliament, [‘Workshop report: EU preparedness against CBRN weapons’](#), 2019, p.11.

⁹⁸ European Parliament, [‘The role of armed forces in the fight against pandemics’](#), 2020, p.2.

⁹⁹ European Parliament, [‘The role of armed forces in the fight against pandemics’](#), 2020, p.2.

¹⁰⁰ European Parliament, [‘How the COVID-19 crisis has affected security and defence-related aspects for the EU’](#), 2020, p. 14.

¹⁰¹ European Parliament, [‘How the COVID-19 crisis has affected security and defence-related aspects for the EU’](#), 2020, p. 14.

for 2022¹⁰². At the same time, the EU Ombudsman started investigating one aspect of the EU's COVID-19 response, namely the European Commission's handling of COVID-19 vaccine contracts¹⁰³.

3.1.5 EU priorities in a post-COVID-19 world

Building on the observation that existing trends at strategic level have to some extent been reinforced and accelerated through COVID-19, the 2020 briefing on 'How the COVID-19 crisis has affected security and defence-related aspects for the EU' highlights 'the need for the EU to be even clearer than before about its priorities and strategic objectives in an era of tighter financial resources and higher political stakes¹⁰⁴.' It outlines a set of choices that the EU will have to make, such as between 'the cost of self-reliance versus the benefits of open markets, the safeguarding of conventional capabilities versus dealing with new threats, maintaining cooperation with great powers whilst resisting undue pressure and who to trust, on what issues, under what conditions and over what timeframe¹⁰⁵.'

In terms of priorities, a risk has been highlighted of EU Member States being distracted by internal problems due to COVID-19 and directing their focus away from third countries which need help. The authors noted that non-action by the EU and the EU Member States today means there will be crises tomorrow and that third countries should consequently remain on the agenda¹⁰⁶.

3.2 Recommendations provided in previous studies and reports

Several recommendations were issued by the authors of the studies, briefings and in-depth analyses which were taken into account for the previous Section. These will be addressed in Chapter 5 in the context of a more detailed discussion of the aspects they refer to, such as procurement cooperation mechanisms, the involvement of EU military capacities, etc., alongside assessments of the extent to which they have already been implemented.

¹⁰² W. Williams and A. Smout, UK's Johnson announces COVID-19 inquiry next year, Reuters [webpage](#), 12.05.2021.

¹⁰³ Corporate Europe Observatory [press release](#), EU Ombudsman starts inquiry on opaque handling by Commission of Covid-19 vaccine-contracts, 22.01.2021.

¹⁰⁴ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p. 14.

¹⁰⁵ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p. 14.

¹⁰⁶ European Parliament, '[How the COVID-19 crisis has affected security and defence-related aspects for the EU](#)', 2020, p. 14.

4 Update on the CBRN threat landscape

Chapter 4 of the study maps the current CBRN threat landscape in the EU. The Chapter first presents the international regimes against the CBRN weapons, which have a potentially important role with regard to reducing the risk of the use of CBRN weapons. It then analyses the CBRN threat stemming from state actors before assessing the CBRN threat emanating from non-state actors. A matrix on threats stemming from state actors, non-state actors, accidents and natural causes has been provided for each of the C, B, R, and N elements and can be accessed in Annex XI.

4.1 International regimes against CBRN weapons

The acknowledgement of the dangers related to CBRN weapons has led to the development of international regimes against these weapons. These international regimes can play an important role in reducing the risks of CBRN weapons being used. However, this depends on their actual effectiveness. The regimes seek to constrain state actors but, by tackling proliferation, also have an impact on non-state actors. Three key treaties underpin the international regimes against CBRN weapons – namely, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Chemical Weapons Convention (CWC) and the Biological and Toxin Weapons Convention (BTWC). Those are examined in greater detail below. However, it is also important to note that those key treaties have been supplemented by additional bilateral and multilateral treaties¹⁰⁷, some of which do not concern CBRN materials directly, but rather the means to deliver them, such as the Arms Trade Treaty (ATT). In addition, some United Nations Security Council Resolutions have introduced new relevant and binding obligations on states, which contribute to addressing the CBRN threat. In this regard, Resolution 1540 has to be mentioned in particular, as it aims at preventing non-state actors from acquiring nuclear, biological, and chemical weapons, their means of delivery, and related materials.

4.1.1 Treaty on the Non-Proliferation of Nuclear Weapons

The NPT is the cornerstone of the international regime against the proliferation of nuclear weapons. It entered into force in March 1970. It aims to prevent the spread of nuclear weapons and weapons technology, foster the peaceful uses of nuclear energy, and further the goal of disarmament. The NPT establishes a safeguards system under the responsibility of the International Atomic Energy Agency (IAEA), which also has competences in the areas of technology transfer for peaceful purposes. The NPT has near-universal membership, with only India, Israel, Pakistan, and South Sudan not being treaty parties. In 1995 a review conference was held in line with provisions in the NPT foreseeing regular reviews of the NPT. At this conference, the NPT was extended indefinitely, and its review process was enhanced to strengthen the treaty overall.

The NPT divides all state parties into two categories. The first category includes the nuclear-weapon states (i.e. the US, Russia, the UK, France and China), which had ‘manufactured and exploded a nuclear weapon or other nuclear explosive devices before 1 January 1967’, according to the terms of the treaty. These five nuclear-weapon states are committed to general and complete disarmament. The second category of state parties comprises the non-nuclear-weapon states, i.e. those committed to not developing or acquiring nuclear weapons (in exchange for the nuclear weapon states’ commitment to pursue disarmament). With their suspected or confirmed nuclear weapons, the non-members India, Pakistan, and Israel would be required to renounce their nuclear weapons before being allowed to join the NPT. Besides these three states, another specific case, which has constituted the greatest challenge to the NPT and the fight against

¹⁰⁷ Information on all treaties, regimes and organisations relevant to CBRN weapons, including full texts of key instruments, can be found on the [website](#) of the Nuclear Threat Initiative (NTI).

nuclear proliferation in general, is that of North Korea. The country became a state party in 1985 but in 2003 declared that it would no longer be bound by the NPT¹⁰⁸. To date, North Korea is the only state to have ever made such a declaration. Subsequently, it tested a nuclear weapon in 2006 and 2009, which led to the imposition of sanctions from the UN Security Council¹⁰⁹. As of 2021, there are about 13,000 nuclear weapons in the world, which are possessed by nine states, namely the US, Russia, the UK, France, China, India, Pakistan, Israel and North Korea¹¹⁰.

4.1.2 The Chemical Weapons Convention

The CWC is a multilateral treaty of unlimited duration that bans chemical weapons and requires their destruction within a set period of time. It builds upon the 1925 Geneva Protocol but is more comprehensive than the Protocol in that the Geneva Protocol did not outlaw the possession of chemical weapons but only their use. The CWC entered into force in 1997 and currently has 193 parties. Although Israel has signed the convention, it has not yet ratified it, whilst North Korea, Egypt, and South Sudan have neither signed nor ratified it. Under the Convention, state parties are required to declare their chemical weapons-related activities or materials, as well as their relevant industrial activities. The CWC is implemented by the OPCW. The OPCW is responsible for inspecting the facilities and monitoring the activities relevant to the CWC in order to ensure compliance.

Under the CWC, state parties are prohibited from the following activities:

- Developing, producing, acquiring, stockpiling, or retaining chemical weapons;
- Directly or indirectly transferring chemical weapons;
- Using or preparing militarily for using chemical weapons;
- Assisting, encouraging, or inducing other states to engage in CWC-prohibited activity;
- Using riot control agents 'as a method of warfare'.

Punitive measures can be recommended by the OPCW against those state parties that are found to have engaged in prohibited actions. In serious cases, the issue could be brought before the UN Security Council and the UN General Assembly.

4.1.3 The Biological and Toxin Weapons Convention

The main instrument governing biological weapons is the 1972 BTWC. It came into force in 1975 and is of unlimited duration. The BTWC prohibits the development, production, stockpiling, acquisition or transfer of biological agents and toxins 'of types and in quantities' that cannot be justified for protective or peaceful use. Moreover, this treaty bans the development of weapons, equipment, or delivery systems for disseminating such biological agents or toxins. Should a state possess any agent, toxin, or delivery system beyond what is justified, they are required to either destroy their stockpile or divert them for peaceful use within nine months from entry into force of the BTWC. Interestingly, the BTWC itself does not explicitly ban the 'use' of biological weapons, but the 1996 Final Declaration of the Review Conference affirmed that their use is also a violation of the BTWC. As of 2021, there are 183 state parties to the Treaty. Review conferences occur every five years to enable the states who are signatories to the Treaty to review the treaty's implementation and develop confidence-building measures.

The BTWC lays down that states shall address compliance issues through multilateral or bilateral cooperation. States also have the possibility to submit complaints to the United Nations Security Council should they suspect that another state is not respecting its obligations under the BTWC. This is stipulated

¹⁰⁸ The Guardian, 'North Korea withdraws from nuclear treaty', 2003.

¹⁰⁹ Nuclear Threat Initiative, 'North Korea's Nuclear Test and its Aftermath: Coping with the Fallout', 2009.

¹¹⁰ SIPRI, SIPRI Yearbook 2021: Armaments, Disarmament and International Security – Summary, Stockholm: SIPRI, 2021, p. 16.

within Article VI of the BTWC, which also obligates state parties to cooperate with any investigation initiated by the United Nations Security Council.

However, the BTWC has been criticised for having several **weaknesses, most notably the absence of a proper verification mechanism**¹¹¹. This is because no autonomous verification body was foreseen in the BTWC, and consequently, such a body was not established. This stands in contrast to other CBRN weapon regimes. For instance, the IAEA verifies the safeguard agreements that have been concluded under the NPT, whilst the OPCW is the verification body for the CWC¹¹². In the absence of any formal verification regime to monitor compliance, parties are encouraged to adhere to the confidence-building measures that are adopted at the regular review conferences, such as the adoption of domestic implementation measures, if required. Given the absence of a verification body, verification of compliance remains a significant challenge. Accusations of violations of the BTWC have consequently been common throughout the history of this treaty¹¹³.

4.2 CBRN threats from state actors

This Section sets out recent developments related to CBRN threats from state actors. It begins by highlighting a concerning global trend, namely the weakening of the international regimes against CBRN weapons. This is followed by an assessment of the CBRN risk presented by six countries of concern, namely Russia, Iran, North Korea, Syria, Turkey and Saudi Arabia.

4.2.1 A concerning trend: the weakening of the international regimes against CBRN weapons

In recent years, the above-introduced international regimes against CBRN weapons have been weakened as a result of several developments, which are presented in the following visualisation and discussed below.

¹¹¹ R. A. Zilinskas, 'Verification of the Biological Weapons Convention', in Erhard Geissler, ed., *Biological and Toxin Weapons Today*, Oxford: Oxford University Press, 1986.

¹¹² S. Drobisz, 'Verification and implementation of the Biological and Toxin Weapons Convention', *The Nonproliferation Review*, 2021.

¹¹³ Arms Control Association, 'The Biological Weapons Convention (BWC) At A Glance', Fact Sheets and Briefs, March 2020.

Figure 0.3 The weakening of the international regimes against CBRN weapons¹¹⁴

First of all, there have been significant **concerns about the nuclear programmes run by some states that are not nuclear-weapon states, according to the NPT**. Those include Iran and North Korea, both of which are examined in greater detail below. In addition, other non-nuclear-weapon states, particularly Turkey and Saudi Arabia, have recently expressed an interest in acquiring nuclear weapons, which is also considered in the next Section.

Furthermore, with regard to nuclear weapons, there has been **increasing criticism from non-nuclear-weapon states**, in particular states belonging to the Non-Aligned Movement, that the NPT nuclear-weapon states have not made sufficient efforts to meet the disarmament aim of the NPT¹¹⁵. A case in point is that of the UK, which has recently reversed its previous commitment to reduce its stockpile of nuclear warheads. In March 2021, a governmental review of the British foreign policy called for an increase in the cap on warheads from 180 to 260 by the middle of the decade with a view to countering threats from Russia and China¹¹⁶.

Moreover, in an important development for Europe, the Intermediate-range Nuclear Forces (INF) **treaty came to an end in 2019**. This was a bilateral treaty between the US and the Soviet Union, and subsequently, the Russian Federation, which banned nuclear missiles with short, medium and intermediate range, with the exception of air- or sea-launched missiles. The US' withdrawal from the INF came after months of tensions during which the US and Russia accused each other of violating the terms of the treaty, although both parties denied these allegations. Likewise, the increasing growth of the Chinese missile arsenal was cited. With Russia withdrawing one day after the US and the treaty consequently coming to an end, test fires of missiles that would not have been allowed under the INF have

¹¹⁴ Source: Study team.

¹¹⁵ J. Carlson, 'Is the NPT Still Relevant? – How to Progress the NPT's Disarmament Provisions', *Journal for Peace and Nuclear Disarmament*, 2(1): 97-113., 2019

¹¹⁶ Deutsche Welle, 'UK pledges to increase nuclear warhead stockpile, boost Asian ties following foreign policy report', 2021.

been observed¹¹⁷. The ending of the INF is a worrying development for the EU and its Member States, given the key role that the INF has traditionally played in the European security architecture. As such, it could lead to a **worsening of European security**¹¹⁸. European countries could now see the new deployment of intermediate- and short-range (nuclear) missiles on their territory, thereby potentially putting them in the line of fire of nuclear weapons. The possible redeployment of US missiles on European soil would arguably not be popular in Europe. However, if this hypothetical possibility were refused, it would arguably leave European countries exposed to Russia.

Furthermore, several states have shown their disregard for the regimes against CBRN weapons by **using CBRN agents in assassination attempts** – some of which have been successful – against specific individuals, including former spies and opponents. In November 2006, a former Russian spy Alexander Litvinenko was killed with **radioactive polonium-210**, which is believed to have been administered to him in a cup of tea at a hotel¹¹⁹. A public inquiry later concluded that Russian President Putin had probably approved his assassination¹²⁰. In February 2017, Kim Jong-Nam, the half-brother of North Korea's leader Kim Jong-un, was assassinated at the Kuala Lumpur airport in Malaysia with the **nerve agent VX**. In March 2018, the nerve agent **Novichok** was used in the attempted poisoning of Sergey Skripal and his daughter Yulia in Salisbury in the UK. Although they both survived, two members of the general public were later exposed to the **nerve agent**, which had been carelessly discarded in a perfume bottle after the Skripal attack, and one of them later died. One of the responding police officers was also contaminated and eventually left his job¹²¹. In August 2020, Alexei Navalny, a critic of Vladimir Putin and opposition leader, fell ill on a plane after having also been poisoned with a chemical nerve agent of the Novichok group¹²². **What is striking about these cases is that all these attacks were committed by agents operating away from their home country in public places with a possible risk of collateral damage**, which materialised in the case of the Salisbury attacks, as indicated above¹²³.

Overall, these worrying developments are symptoms of a **weakening of the global norms at the heart of the regimes against CBRN weapons**, such as 'CBRN weapons should never be used' or 'states should work towards a world without CBRN weapons'¹²⁴. Therefore, further violations of arms control agreements may be expected. At the same time, it can be expected that non-state actors will possess the continued possibility of access to CBRN weapon materials in the years to come. The aim of a world without CBRN weapons will also remain unrealistic in the short term and medium term.

Arguably, an important factor contributing to this weakening of the international regimes against CBRN weapons has been the **continued lack of effective sanctions against the use of CBRN weapons**. This has particularly been the case with chemical weapons, which have been used in Syria, Malaysia and the UK in recent years by both non-state and state actors. The perpetrators of these attacks have only faced limited consequences, if any. A case in point has been Syria. Various countries and entities, including the EU, have imposed complex sanctions on the country since 2011. However, those have not managed to incentivise political change or to convince the Syrian government to stop using violence against its own population, whilst ordinary Syrian citizens appear to have been far more affected by the sanctions than the Syrian

¹¹⁷ BBC News [website article](#), INF nuclear treaty: US tests medium-range cruise missile, 20.8.2019.

¹¹⁸ D. Audenaert, 'The End of the INF-Treaty: Context and Consequences', Security Policy Brief 111, Brussels: Egmont Institute, 2019.

¹¹⁹ BBC News, 'Alexander Litvinenko: Profile of murdered Russian spy', 2016.

¹²⁰ BBC News [website article](#), 'Litvinenko inquiry: Key findings', 21.01.2016.

¹²¹ BBC News [website article](#), 'Salisbury Novichok-poisoned officer Nick Bailey quits', 17.10.2020.

¹²² P. Oltermann and S. Walker, 'Alexei Navalny novichok finding prompts calls for answers from Moscow', Guardian, 2020.

¹²³ T. Sadik, 'Trends in recent CBRN incidents' in Su, Fei and Anthony, Ian, eds, *Reassessing CBRN Threats in A Global Changing Environment*, Stockholm: SIPRI, 2019, p. 3-7.

¹²⁴ The Hague Centre for Strategic Studies and Clingendael, 'CBRN Weapons – Global Security Pulse, Strategic Monitor 2019-2020', The Hague: The Hague Centre for Strategic Studies/Clingendael, 2019.

establishment¹²⁵. This lack of effective sanctions or strong military reaction might arguably encourage other actors to use chemical weapons, leading to a global erosion of the norm against the use of chemical weapons that has been enshrined in the CWC¹²⁶. Nonetheless, some observers are less pessimistic in their assessments¹²⁷.

4.2.2 State actors of particular concern

This Section analyses the CBRN-relevant activities of four states that are of particular concern for the purpose of this study, namely Russia, Iran, North Korea and Syria, given their scale and variety, as well as their potential consequences for the EU and its EU Member States. It then continues by examining two states that are not currently known to possess CBRN weapons programmes but have indicated an interest in acquiring nuclear weapons, namely Turkey and Saudi Arabia.

Russia

With regard to nuclear weapons, Russia is **one of five recognised nuclear-weapon states** under the NPT, as it inherited this status as the legal successor of the Soviet Union. Historically, together with the US, Russia has also taken part in several bilateral arms control treaties and initiatives. However, tensions have risen between the two countries in recent years, and their relationship has deteriorated, leading to an overall worsening of bilateral arms control and non-proliferation.

Russia is in the process of **expanding and modernising its entire arsenal of strategic nuclear weapons and delivery systems**. It considers that its nuclear capabilities are necessary for deterrence against the US and NATO¹²⁸. Moreover, there continues to be significant concern about physical security at Russian nuclear sites and thus the risk of nuclear accidents, despite the improvements that have been made in the last few years.¹²⁹

With regard to biological weapons, the Russian government's official position is that it does not maintain any stockpile of biological weapons and refrains from engaging in any illegal development or production activities. As the legal successor of the Soviet Union, Russia has inherited its status as a party to the Geneva Protocol and the BTWC. However, **there are serious doubts as to Russia's actual compliance with the BTWC**. Historically, the Soviet Union was arguably the most infamous example of non-compliance during the Cold War, despite its status as a state party. As part of the Soviet biological weapons programme, which runs by the Biopreparat agency, a range of pathogens was weaponised. Following the dissolution of the Soviet Union, Russian President Boris Yeltsin stated that the Soviet Union had not complied with the BTWC before publishing a decree that outlawed any activities within the Russian Federation that did not adhere to the treaty. However, the Kremlin's stance on this issue changed under the leadership of Vladimir Putin, who has denied that the Soviet Union ever ran an offensive biological weapons programme¹³⁰. Since the mid-1990s, the Russian authorities have also refused foreign inspectors access to some of the military facilities that used to play a key role in the biological weapons programme of the Soviet Union during the Cold War. Moreover, Russia possesses developed pharmaceutical and biotechnological sectors, which means that there is considerable infrastructure and expertise that could be deployed towards an offensive biological weapons programme. All these aspects have contributed to fuel suspicions about a possible lack

¹²⁵ A. Ibrahim, 'The Dilemmas in the Debate on Syria Sanctions', Geneva: Geneva Centre for Security Policy, 2021.

¹²⁶ J. Masterson, 'Chemical Weapons Use Will Need More Than Another Syria Censure to Survive', Just Security, 2021.

¹²⁷ P. Richard, 'Syria and the Chemical Weapons Taboo', Journal of Global Security Studies, 4(1): 37-52, 2019.

¹²⁸ Office of the Director of National Intelligence, Annual Threat Assessment of the US Intelligence Community, 2021, p. 10.

¹²⁹ National Intelligence Council, [Annual Report](#) to Congress on the Safety and Security of Russian Nuclear Facilities and Military Forces, 2011.

¹³⁰ L. Trakimavičius Is Russia Violating the Biological Weapons Convention?, Atlantic Council [webpage](#), 2018.

of compliance with the BTWC¹³¹. **The existence of a biological weapons programme would cause significant proliferation risks.** Even if the former Soviet biological weapons programme was no longer in operation, which is disputed¹³², there are biological proliferation risks derived from the legacy of the Soviet programme. In this regard, there are concerns over the security of the pathogen culture collections and risks that former biological weapons scientists from the Soviet Union could share their expertise with other state or non-state actors.

Through pro-Kremlin media outlets, Russia has also played a key role in spreading disinformation about CBRN weapons. In the last few years, a significant amount of disinformation has concerned the Syrian civil war, in which chemical weapons have been used. The Russian government and Russian state-controlled media have notably accused the Syrian Civil Defence (SCD) – a search-and-rescue organisation based in the opposition-held areas of Syria, also known as the ‘White Helmets’ – of being involved in attacks with the use of chemical weapons in Syria. However, no reputable body has ever put forward reliable evidence that the SCD would have contributed to perpetrating such attacks, whereas the Syrian government has been found responsible for undertaking repeated chlorine and sarin attacks in the last few years¹³³. Other CBRN-related issues were found at the heart of pro-Kremlin disinformation narratives, such as the claims that the US developed a network of secret biological laboratories around the world. The Russian government has also accused others of spreading disinformation. For instance, it claimed that the German government was responsible for a ‘mass disinformation campaign’ against Russia, following the poisoning of a Russian opposition leader Alexei Navalny¹³⁴. The issue of Russia's disinformation campaigns and their nefarious impact on Europe has long been acknowledged by the EU, which has notably set up the so-called ‘East StratCom Task Force’, which aims at addressing Russia’s disinformation campaigns¹³⁵.

The spread of disinformation concerning CBRN weapons is highly concerning, as it carries at least three significant risks. First, it may complicate expert assessments of CBRN threats, both prior to any CBRN incident and after such incidents, as they are being investigated. In the words of a US CBRN expert, ‘certain recent disinformation campaigns have become so overwhelmingly comprehensive and effective that they constitute a new kind of threat’, as they make it increasingly difficult to ensure accountability and compliance with arms control regimes¹³⁶. Second, during armed conflicts, disinformation may influence military personnel, thereby affecting their morale and discipline¹³⁷. Third, the spread of disinformation may have a deleterious effect on the response to a CBRN attack by affecting first responders and the general population, which, for example, may not trust the information given by governments as a result of disinformation campaigns.

¹³¹ See R. A. Zilinskas, *The Soviet Biological Weapons Program and Its Legacy in Today's Russia*, Washington, DC: National Defense University Press, 2016.

¹³² L. Trakimavičius *Is Russia Violating the Biological Weapons Convention?*, Atlantic Council [webpage](#), 2018.

¹³³ Bellingcat, ‘Chemical Weapons and Absurdity: The Disinformation Campaign Against the White Helmets’, 18 December 2018.

¹³⁴ Deutsche Welle, ‘Russia accuses Germany of spreading misinformation on Navalny’, 30 November 2020.

¹³⁵ See their [website](#), which notably contains a database comprising more than 12,000 cases of pro-Kremlin disinformation (Disinfo database).

¹³⁶ M. Stewart, ‘Defending Weapons Inspections from the Effects of Disinformation’, *American Journal of International Law*, 115, p. 106, 2021.

¹³⁷ D. Kaszeta, ‘The Forensic Challenge’, *PRISM*, 7(3), p. 86, 2018.

Box 0.2 Common pro-Kremlin disinformation narratives**Common pro-Kremlin disinformation narratives**

On the OPCW: various pro-Kremlin reports have accused the OPCW of lacking integrity and independence in the context of the Syrian conflict.

On Alexei Navalny's poisoning: an unsupported conspiracy theory has suggested that the poisoning of Alexei Navalny has been orchestrated by the West with a view to blaming Russia. This would in turn justify the adoption of further sanctions against Russia and/or prevent the construction of Nord Stream 2. Both the EU and the US are said to have been the main beneficiaries of Navalny's poisoning.

On the US secret laboratories in Ukraine: recurrent conspiracy theories are that the US has created biological weapons in Ukraine that would only infect 'Eastern Slavs' and that these experiments have resulted in disease outbreaks.

Source: Disinfo database of the East StratCom Task Force.

Iran

Iran continues to present a significant threat to the EU and its Member States, as well as to the US and other US allies. In the field of CBRN weapons, the most worrisome development in recent years has been Iran's expansion of its nuclear programme. Iran has had an active nuclear programme for decades but has always maintained that its purpose is peaceful. This claim has been questioned for a few years, as the Iranian authorities have been accused of actively working towards acquiring a nuclear arsenal¹³⁸. In its most recent Annual Threat Assessment of April 2021, the Office of the Director of National Intelligence in the US assessed that 'Iran is not currently undertaking the key nuclear weapons-development activities that we judge would be necessary to produce a nuclear device'¹³⁹. **However, since the US withdrew from the 2015 JCPOA, Iran has abandoned several of its commitments and has resumed some activities that are not in compliance with the JCPOA limits**¹⁴⁰.

In May 2018, under President Trump, the US Administration unilaterally withdrew from the JCPOA to pursue a 'maximum pressure' strategy towards Iran. This strategy was strongly supported by some of the Gulf states, most notably Saudi Arabia¹⁴¹. The withdrawal appeared to mainly seek to achieve regime change more broadly, rather than focusing on the specific issue of addressing Iran's nuclear programme. One of the main components of the Trump Administration's approach was a large set of unilateral sanctions. Those led Iran to launch a counter-strategy of 'maximum resistance' from mid-2019 onwards. This notably included no longer complying with its own obligations under the JCPOA. Iran's violations of the JCPOA commitments particularly escalated in reaction to the assassination – allegedly by Israel – of one of its main nuclear scientists¹⁴². As a consequence, besides a rise in tensions in the region, the non-proliferation clauses contained in the JCPOA have been eroded in three main ways. Firstly, it is estimated that Iran now possesses a considerably larger stockpile of enriched uranium than what was foreseen by the JCPOA, whilst its rate of enrichment is also considerably higher than what was permitted. As a result, Tehran is now able to produce the fissile material necessary for producing a nuclear bomb much faster. Secondly, the Iranian government decided to suspend the verification and monitoring activities of the

¹³⁸ C. Davide, 'How quickly can Iran make a nuclear bomb?', *Nature*, 2020.

¹³⁹ Office of the Director of National Intelligence, Annual Threat Assessment of the US Intelligence Community, 2021.

¹⁴⁰ BBC News [website article](#), 'Iran rolls back nuclear deal commitments', 2020.

¹⁴¹ Reuters, 'Saudi official: Expanded talks should follow any Iran nuclear deal', 2021.

¹⁴² D. De Luce, 'Assassination of Iranian scientist won't halt Iran's nuclear program, experts say', NBC News, 2020; P. Wintour and O. Holmes, 'Iran vows retaliation after top nuclear scientist shot dead near Tehran', *The Guardian*, 2020.

IAEA, although the agency managed to negotiate a 'bilateral technical understanding' for a three-month period¹⁴³. Thirdly, although uranium enrichment can be scaled back and full IAEA access may be restored, it is feared that some irreversible knowledge gain may have taken place through all the research and development activities that have taken place over the last few months, for example on advanced centrifuges.

The new US President Biden has been very critical of the maximum pressure strategy and took some symbolic steps early on to improve diplomatic negotiations with Tehran. Nevertheless, to date, the Iranian government has refused to directly engage with the US Administration until the economic sanctions against them are lifted. In April 2021, all JCPOA participants met for in-person talks in Vienna in the presence of representatives of the US, although the latter did not have any direct contact with the Iranian delegation¹⁴⁴. Nonetheless, it was seen as an indicator for a possible revival of a nuclear deal with Iran. A few days later, however, the UK, France and Germany expressed their concern at Iran's decision to enrich uranium at 60 per cent purity, which brings them close to the 90 per cent level that is required for weapons-grade fuel. They saw this move as going against the spirit of the discussions that had just been held. Moreover, there have been suspicions that the Iranian government has failed to declare several sites, as it has failed to fully explain the origin of uranium traces found at three sites where the IAEA has conducted inspections¹⁴⁵. Thus, **significant uncertainty remains as to whether the JCPOA can be fully revived**. In any case, there is a widespread perception that, even if the JCPOA is re-established in an adapted form, **there is a strong need for further negotiations in order to deal with other important matters of concern, such as the Iranian development of ballistic missiles**¹⁴⁶.

North Korea

The last few years have seen a significant development of North Korea's nuclear arsenal, both qualitatively and quantitatively. This severe proliferation crisis is of serious concern for the EU. In February 2021, it was reported that North Korea maintained its nuclear facilities, produced fissile material, upgraded its ballistic missiles and continued its attempts at importing technologies to support these developments throughout 2020, thereby violating international sanctions¹⁴⁷. Moreover, a report by an independent panel for the UN Security Council concluded that North Korea had 'probably developed miniaturised nuclear devices to fit into the warheads of its ballistic missiles'¹⁴⁸. In addition, although no nuclear test was conducted in 2020, new short-range, medium-range, submarine-launched and intercontinental ballistic missile (ICBM) systems were displayed at military parades. On 10 October 2020, North Korea unveiled what appeared to be North Korea's biggest-ever ICBM at a military parade in Pyongyang¹⁴⁹.

In 2018 and 2019, former US President Donald Trump had met three times with North Korea's leader, Kim Jong-un, but had failed to come to an agreement. The Biden Administration conducted a North Korea policy review in spring 2021. The US Administration has stated its aim to achieve the complete denuclearization of the Korean Peninsula. Some argue that this is a more promising phrasing than 'denuclearization of North Korea', which Pyongyang tends to interpret – and reject – as a call for unilateral disarmament. There also appears to be a recognition of the possible benefits of a more piecemeal

¹⁴³ K. Davenport, 'Iran, IAEA Reach Monitoring Agreement', Arms Control Today, 2021.

¹⁴⁴ D.M. Herszenhorn and J. Barigazzi, 'Vienna meeting signals new push to revive Iran nuclear deal', Politico, 2021.

¹⁴⁵ F. Murphy, 'Iran fails to explain uranium traces found at several sites -IAEA report', Reuters, 2021.

¹⁴⁶ S. Shams, 'Heiko Maas in Tehran: Why Germany can't concede too much to Iran', Deutsche Welle, 2019.

¹⁴⁷ Reuters, 'North Korea upgraded nuclear missile programme in 2020, says UN diplomat', Guardian, 2021.

¹⁴⁸ Guardian, 'North Korea has "probably" developed nuclear devices to fit ballistic missiles – UN', 2020.

¹⁴⁹ A. Quintin, 'North Korea's recent nuclear advances: what are the implications for European security?', Global Risk Insight, 2020.

approach, in the sense of engaging in negotiations with North Korea with more limited aims than complete disarmament.

However, for his part, the North Korean leader has recently announced his ambition to take his nuclear and conventional forces through a modernisation plan, as confirmed by the resumption of the testing of ballistic missiles in 2021. However, the current economic difficulties in North Korea, which have resulted from the pandemic, economic mismanagement and the United Nations Security Council sanctions, might provide the US Administration with a diplomatic opening¹⁵⁰.

North Korea's nuclear capabilities represent a significant risk for EU's security. The development of its nuclear capabilities and ballistic missiles constitutes the most severe proliferation crisis for the EU on the international stage. In addition to the fact that North Korean ICBMs could reach Europe, there could be **dissemination and transfers** of materials and technologies towards terrorist groups or other states, which could be based closer to Europe. In addition, a failure in reaching a deal with North Korea to put an end to its nuclear military programme would strongly undermine the NPT and lead to a further escalation of tensions in the region¹⁵¹. If the EU does not take high-level initiatives for a political dialogue with North Korea soon, there is a further risk that it could be **side-lined from further negotiations on the denuclearisation of the Korean Peninsula**, as has often happened to date¹⁵².

Syria

Syria is a state of concern with regard to CBRN weapons due to its development and proven use of chemical weapons. It has only developed a small nuclear programme, whilst there has not been any strong evidence that it would have launched a biological weapons programme. Western intelligence services long suspected that Syria had developed one of the most important operational chemical weapons programmes in the world. The first public announcement by the Syrian government to this end took place in July 2012, when the government stated that it indeed possessed chemical weapons. Not only had it accumulated a stockpile of chemical agents, including tons of sulfuric mustard, VX¹⁵³ and sarin, but evidence also suggested that it had acquired the capability to deliver these agents with artillery rockets, ballistic missiles or aerial bombs¹⁵⁴.

Widespread use of chemical weapons was already observable and repeatedly confirmed during the Syrian conflict¹⁵⁵. In particular, the hitherto worst attack involving chemical weapons in the 21st century took place in Ghouta in August 2013. This sarin nerve agent attack killed hundreds of people, many of them non-combatants¹⁵⁶. The Syrian government later found itself under pressure from the international community and decided to accede to the CWC. This led to the rapid elaboration of a detailed plan for the accounting, inspection, control, and elimination of Syria's chemical weapons. This was initially hailed as a success by the international community¹⁵⁷. However, Syria eventually missed the deadline for removing all of its

¹⁵⁰ A. Panda, 'Biden's Next Steps on North Korea Contain a Dose of Realism', Washington, DC: Carnegie Endowment for International Peace, 2021.

¹⁵¹ A. Quintin, 'North Korea's recent nuclear advances: what are the implications for European security?', Global Risk Insight, 2020.

¹⁵² E.J. Ballbach, 'The end of Critical Engagement: on the failures of the EU's North Korea strategy', Madrid: Royal Elcano Institute, 2019.

¹⁵³ VX is the most toxic of the known chemical warfare agents.

¹⁵⁴ French Defence Ministry, 'Syria/Syrian chemical programme – National executive summary of declassified intelligence', Paris, 2013.

¹⁵⁵ T. Schneider and T. Luetkefend, 'Nowhere to Hide: The Logic of Chemical Weapons Use in Syria', Berlin: Global Public Policy Institute, 2019.

¹⁵⁶ J. Hart and R. Trapp, 'Collateral damage? The Chemical Weapons Convention in the Wake of the Syrian Civil War', Arms Control Today, 2018.

¹⁵⁷ P. C. Bleek and N. J. Kramer, 'Eliminating Syria's Chemical Weapons: Implications for Addressing Nuclear, Biological, and Chemical Threats', Nonproliferation Review, 23(1-2): 197-230, 2016.

chemical weapons from the country. More importantly, it later appeared that Syrian forces were using chemical weapons again¹⁵⁸. This was evidence that Syria had failed to declare its chemical weapons programme in its entirety and had retained its capacity to produce chemical weapons beyond the official destruction of its programme. Thus, Syria has not complied with its obligations under the CWC. In that respect, it can be argued that the current situation is worse with Syria being a party to the CWC, as it is challenging the international regime against chemical weapons from the inside.

Further, in April 2021, an investigation report of the OPCW concluded that there were reasonable grounds to believe that a military helicopter of the Syrian Arab Air Force had dropped at least one cylinder of chlorine over eastern Saraqib, which had affected several individuals. The US State Department concurred with this finding. As a consequence, a few days later, at the second session of the 25th conference of the state parties to the CWC, the member states passed a decision that suspended Syria's rights and privileges under the CWC, including the rights to vote or hold any office in the Conference or Executive Council¹⁵⁹. In so doing, they aimed to put pressure on Syria so that it finally declares all outstanding production facilities and stockpiles, including those used in other previous attacks in 2017.

Thus, the Syrian case provides an apt illustration of the point addressed in Section 4.1 above regarding the perceived lack of effective sanctions against those violating the international norms and treaties against CBRN weapons. The sanctions imposed on Syria since 2011 have not been successful in putting an end to the atrocities committed against the Syrian population and the violation of international norms and treaties¹⁶⁰.

Although the suspension of Syria is a positive step, it is a rather limited one in the face of the atrocities committed and the violation of international norms and treaties. This carries a risk of possibly encouraging other actors to follow suit. Moreover, the Syrian government's continued use of chemical weapons means that the serious risk of chemical proliferation, which already materialised before with the seizure and use of Syrian chemical weapons by the Islamic State¹⁶¹, remains.

Turkey

Turkey is currently a member in good standing of all main treaties governing the acquisition and use of CBRN weapons. It is not known to have ever undertaken a biological weapons or chemical weapons programme. As a member of NATO since 1952, it has benefited from the conventional and nuclear deterrence provided by the Alliance. It is also in the framework of being a NATO member that it has hosted around 50 US tactical nuclear weapons on its territory at Incirlik Air Base¹⁶². However, against the backdrop of the stalling of the negotiations over Turkish EU membership, Turkish President Erdogan has made several public statements about what he perceives to be Turkey's right to acquire nuclear weapons. For example, in September 2019, he declared to fellow members of the Justice and Development Party (AKP) that he 'cannot accept' to be told that Turkey cannot have nuclear weapons, especially as, still according to him, 'there is no developed nation in the world that doesn't have them'¹⁶³, a claim which is factually incorrect. Later that month, he signalled again Turkey's interest in developing and acquiring nuclear weapons during a speech before the UN General Assembly, when he stated that 'the position of nuclear power should either be forbidden for all or permissible for everyone'¹⁶⁴. Experts are currently divided as to whether such statements should be interpreted as indicating a serious intent to pursue nuclear weapons

¹⁵⁸ J. Detsch, C. Lynch and R. Gramer, 'Syria Is Still Trying to Use Chemical Weapons', Foreign Policy, 2020.

¹⁵⁹ Reuters, 'Syria loses chemical weapons watchdog voting rights after poison gas findings', 2021.

¹⁶⁰ A. Ibrahim, 'The Dilemmas in the Debate on Syria Sanctions', Geneva: Geneva Centre for Security Policy, 2021.

¹⁶¹ H. Doornbos and J. Moussa (2016) 'How the Islamic State seized a chemical weapons stockpile', Foreign Policy, 17 August 2016.

¹⁶² S. Bugos, 'Turkey Shows Nuclear Weapons Interest', Arms Control Today, 2019.

¹⁶³ Reuters, 'Erdogan says it's unacceptable that Turkey can't have nuclear weapons', 4 September 2019.

¹⁶⁴ S. Bugos, 'Turkey Shows Nuclear Weapons Interest', Arms Control Today, 2019.

on Ankara's part. Some dismiss these comments as merely signalling the Turkish government's intent to be recognised as an important actor on the international stage and argue that economic considerations are acting as a disincentive not to pursue nuclear weapons¹⁶⁵. Others contend that these claims are concerning because they have to be interpreted against the backdrop of closer relations with two nuclear weapon-armed states, namely Russia and Pakistan¹⁶⁶. In this context, Russia is currently building four large civilian nuclear power reactors at the Akkuyu Nuclear Facility in Turkey, whilst there has also been a significant increase in the number of Turkish engineering students studying nuclear sciences in the Russian Federation. Turkey has also strengthened its relations with Pakistan since 2018, promoting its position in the Kashmir dispute and supplying weaponry to Islamabad¹⁶⁷.

Saudi Arabia

In 2018, Crown Prince Mohammed bin Salman declared that Saudi Arabia would seek to develop its own nuclear weapons if Iran were to acquire one¹⁶⁸. This has prompted concerns over the possibility that the Saudi civilian nuclear programme could eventually lead to the development of nuclear weapons in a bid to compete with Iran. These concerns have been compounded by a lack of transparency, as Saudi Arabia has refused to accept the full monitoring programme of the IAEA. Moreover, in September 2020, the Guardian reported on having had sight of reports prepared by Chinese geologists for the Saudi monarchy, which indicated that Saudi Arabia would possess significant uranium reserves. Although the actual amounts of reserves and the costs of extraction have not been confirmed yet, such a development indicates that Saudi Arabia is actively seeking to secure a domestic source of uranium, which could be used for developing a nuclear weapons programme¹⁶⁹. Having access to domestic reserves of uranium would constitute a significant advantage for any state seeking to develop nuclear weapons, as it would not have to depend on the foreign supply of uranium, which could come with constraints¹⁷⁰. In addition, US intelligence agencies have highlighted Saudi Arabia's cooperation with China in order to build industrial capacity for the production of nuclear fuel, which could be eventually enriched¹⁷¹.

However, it is important not to over-inflate these legitimate concerns¹⁷². Should Saudi Arabia have decided to embark on a path towards acquiring nuclear weapons, which is still unclear at present, it is likely that it would still take years before it was able to produce a nuclear weapon. Nevertheless, it will be crucial for the international community to remain vigilant and to try and persuade the Saudi monarchy to increase its cooperation with the IAEA.

¹⁶⁵ G. Perkovich and S. Ülgen, 'Why Turkey Won't Go Nuclear', Carnegie Endowment for International Peace, 2015.

¹⁶⁶ J. Spacapan, 'Conventional wisdom says Turkey won't go nuclear. That might be wrong.', Bulletin of the Atomic Scientists, 2020.

¹⁶⁷ J. Spacapan, 'Conventional wisdom says Turkey won't go nuclear. That might be wrong.', Bulletin of the Atomic Scientists, 2020.

¹⁶⁸ BBC News, 'Saudi Arabia pledges to create a nuclear bomb if Iran does', 2018.

¹⁶⁹ E. Graham-Harrison, S. Kirchgaessner and J. Borger, 'Revealed: Saudi Arabia may have enough uranium ore to produce nuclear fuel', Guardian, 2020.

¹⁷⁰ Z. Mian, A. H. Nayyar and R. Rajaraman, 'Exploring Uranium Resource Constraints on Fissile Material Production in Pakistan', Science & Global Security, 17(2-3): 77-108, 2009.

¹⁷¹ M. Chaziza, 'Saudi Arabia's Nuclear Program and China', Middle East Institute, 2020.

¹⁷² A. Ahman, 'Saudi Arabia's Nuclear Program: Separating Real Concerns from Threat Inflation', Bulletin of the Atomic Scientists, 2020.

Box 0.3 CBRN threat from state actors – key points

CBRN threat from state actors – key points

A key trend regarding the CBRN threat from state actors has been the weakening of the main international regimes against CBRN weapons, including through the ending of treaties and non-compliance by signatories.

In the nuclear domain, there has been a **trend towards the modernisation of nuclear arsenals** of nuclear-weapon states. In addition, several non-nuclear-weapon states have actively pursued nuclear weapons (e.g. Iran, North Korea), whilst others have expressed a potential interest in acquiring nuclear weapons (e.g. Turkey, Saudi Arabia).

Chemical weapons have been widely used during the Syrian War, and the actions of the Syrian government have considerably challenged the international regime against chemical weapons.

Concerning biological weapons, there have been concerns regarding Russia's compliance with the BTWC.

As a consequence, **the risk of proliferation – to other state actors or non-state actors – has been increasing.**

4.3 CBRN threats from non-state actors

This Section focuses on terrorists, as non-state actors that seek to develop or acquire CBRN weapons would fall under the umbrella of 'terrorism'.

4.3.1 Incentives and disincentives for terrorists to acquire CBRN weapons

Terrorists use different means to conduct a terrorist attack. For one, they use conventional weapons, but there are also examples in which everyday equipment was weaponised, such as lorries (e.g. Nice and Berlin Christmas market terrorist attacks) or even kitchen knives. Since there are readily available, possibly easier means for carrying out terrorist attacks, it is important to consider why terrorists may decide to seek CBRN materials.

There are several incentives for terrorists to consider the acquisition of CBRN materials, which include the following (although not all of them are compatible with one another):

- The potential to inflict mass casualties, as well as significant physical or economic damage;
- The willingness to answer the calls of some clerics who have advocated the use of CBRN weapons against Western populations (theological motivation)¹⁷³;
- The strong symbolism of a successful CBRN terrorist attack, which would demonstrate the power of the group;
- The likelihood of damaging the reputation of the government of the targeted country, given the significant challenges involved in responding to a CBRN terrorist attack;
- The potential for drawing significant attention both in traditional and social media, which could raise the international profile of the group, thereby supporting recruitment and fundraising efforts;

¹⁷³ For example, in an article published in the online English-language magazine *Inspire* after his death, radical cleric Anwar al-Awlaki – who was a key leader of al Qaeda in Yemen – quoted several religious scholars to justify attacks involving CBRN weapons 'against the disbelievers who are at war with us'. He stated that '[the] use of poisons of chemical and biological weapons against population centres is allowed and strongly recommended due to the effect on the enemy' (T. Lister and P. Cruickshank, 'From the grave, al-Awlaki calls for bio-chem attacks on the U.S.', [CNN Security Clearance](#), 2 May 2012.).

- The potential to cause significant panic in the targeted society;
- The potential to cause harm over a sustained period of time, for example, as a result of the environment having been contaminated;
- The possibility of discreetly inflicting serious harm, as some CBRN agents may be highly lethal, whilst being difficult to detect ('silent killers')¹⁷⁴.

Thus, CBRN weapons might not only be of interest to those seeking to inflict a maximum amount of damage. They may also be seen as advantageous by those who aim to create a significant amount of fear and anxiety in societies, as this is more likely to be achieved through the use of CBRN weapons than through conventional weapons.

Nevertheless, **there are also disincentives for using CBRN weapons in terrorist attacks.** These include:

- The difficulty of acquiring CBRN materials, as well as the means to deliver them, in relation to conventional weapons;
- Fears inherent to handling CBRN materials;
- The lack of required knowledge and skills for handling CBRN materials, although the development of the internet and the Darknet have addressed this challenge to some extent, as explained below;
- Fears of retaliation, which could be very strong;
- The amount of controversy surrounding the use of CBRN weapons, which may decrease support for the perpetrators from their network or supporters;
- The relatively higher uncertainty and risks of failure given the complexity involved, relatively to using conventional weapons¹⁷⁵.

This explains why, although CBRN terrorist attacks are feasible, they have rarely taken place in practice to date. This is discussed in greater detail in the next Section and should also be borne in mind when assessing the current and future risks of CBRN terrorism.

4.3.2 Past instances of CBRN terrorist plots

In practice, there has ever only been a very small number of terrorist attacks involving CBRN materials. Starting with **chemical weapons**, in 1990, the Tamil Tigers used chlorine gas in an assault against a Sri Lankan Armed Forces Special Task Force camp in East Kiran¹⁷⁶. The Japan-based 'Aum Shinrikyo' cult also used chemical weapons against various targets between 1990 and 1995. Those included phosgene, hydrogen cyanide, and the nerve agents sarin and VX¹⁷⁷. Their most infamous attack was arguably against the Tokyo subway in 1995, which involved releasing sarin in five trains during the morning rush hour. A dozen victims died whilst hundreds more were injured¹⁷⁸. The number of cases where

¹⁷⁴ V.H. Asal and G.A. Ackerman and K.R. Rethemeyer, 'Connections Can Be Toxic: Terrorist Organizational Factors and the Pursuit of CBRN Weapons', *Studies in Conflict & Terrorism*, 35(3): 229-254, 2012.

¹⁷⁵ S. E. Meulenbelt and M. S. Nieuwenhuizen, 'Non-State Actors' Pursuit of CBRN Weapons: From Motivation to Potential Humanitarian Consequences', *International Review of the Red Cross*, 97(899): 831-858, 2015; V.H. Asal, G.A. Ackerman and K.R. Rethemeyer, 'Connections Can Be Toxic', 2012.

¹⁷⁶ B. Hoffman, 'The First Non-state Use of a Chemical Weapon in Warfare: The Tamil Tigers' Assault on East Kiran', *Small Wars & Insurgencies*, 20(3-4): 463-477, 2009.

¹⁷⁷ C.W. Hughes, 'Japan's Aum Shinrikyo, the Changing Nature of Terrorism, and the Post-Cold War Security Agenda', *Global Change, Peace & Security*, 10(1): 39-60, 1998.

¹⁷⁸ R. Danzig et al., *Aum Shinrikyo: Insights into How Terrorists Develop Biological and Chemical Weapons*, 2nd edition, Washington, DC: Center for a New American Security, 2012.

individuals and terrorist groups have used biological weapons is also very limited. There have been some examples in the US, including the use of salmonella by a cult in 1984, as well as the mailing of letters containing *Bacillus anthracis* spores or powdered ricin to various recipients, including US Senators and the US president, in the last few years¹⁷⁹. The 'Aum Shinrikyo' cult also attempted, albeit unsuccessfully, to use *Bacillus anthracis* and botulinum toxin against several targets. **There has not been any instance of radiological or nuclear attack successfully conducted by a terrorist group.**

As such, historically, the number of terrorist plots involving CBRN agents has been very limited, and the number of terrorist attacks successfully conducted even smaller. Evidently, the past is not an exact predictor of the future, but it is important to place any assessment of the current terrorist threat in its historical context.

4.3.3 Assessment of the current threat of CBRN terrorism in Europe

Assessing the CBRN terrorist threat

Various scholars have compared and contrasted the various CBRN weapons potentially at the disposal of terrorists¹⁸⁰, and there are differences amongst experts as to the exact degree of seriousness of the CBRN threat¹⁸¹. There is also a lack of agreement as to the most likely form that a CBRN terrorist attack would take. Nevertheless, a CBRN terrorist threat is generally perceived as being of **low probability** but also of potentially high impact in the case of it occurring.

Although one may talk about the 'CBRN terrorist threat', there are **significant differences between CBRN weapons with regard to their complexity, construction, delivery and effect or impact**. It is impossible to offer a general and definitive ranking of CBRN weapons in terms of the ease with which they can be acquired or the scale of the damage they could cause. This is because many factors are at play, including the size of the terrorist group seeking to obtain them, the aims of the terrorists, their technical expertise or even the weather on the day these weapons would be used in an attack. Historically during the Cold War, it was most desirable for states to obtain nuclear weapons, which were then seen to be at the top of the hierarchy of CBRN weapons, not the least because of their role in deterrence towards other states. Considering that terrorists may have more modest aims than, for instance, deterring a superpower, it might be sufficient for them to seek to possess and subsequently possibly use another type of CBRN weapon than nuclear ones.

Nevertheless, some limited general observations can be offered regarding the type of CBRN weapons which might be used in the event of a potential terrorist attack. In terms of damage, the most devastating attack would likely involve the use of nuclear agents. However, the risk of such an attack is extremely low. This is mainly because of serious obstacles in acquiring nuclear weapons. Initially, some concerns were, for example, voiced about the security of nuclear weapons within the Russian territory, especially whether portable nuclear devices often referred to as 'suitcase nukes' could fall into the wrong hands. However, since then, it has been concluded that the probability that such devices were lost appears to be low and that, even if some had been lost, the effectiveness of these devices should be assessed as very low¹⁸². In

¹⁷⁹ B.O. Newsome and J.A. Jarmon, *A Practical Introduction to Homeland Security and Emergency Management: From Home to Abroad*, Thousand Oaks, CA: CQ Press, 177-183, 2016.

¹⁸⁰ S. E. Meulenbelt and M. S. Nieuwenhuizen, 'Non-State Actors' Pursuit of CBRN Weapons', 2015; V.H. Asal, G.A. Ackerman and K.R. Rethemeyer, 'Connections Can Be Toxic', 2012; P. Cornish, 'The CBRN System: Assessing the Threat of Terrorist Use of Chemical, Biological, Radiological and Nuclear Weapons in the United Kingdom', An International Security Programme Report, London: Chatham House, 2007.

¹⁸¹ P. Cornish, 'The CBRN System: Assessing the Threat of Terrorist Use of Chemical, Biological, Radiological and Nuclear Weapons in the United Kingdom', An International Security Programme Report, London: Chatham House, 2007.

¹⁸² James Martin Center for Nonproliferation Studies, "'Suitcase Nukes': A Reassessment", Monterey, CA: James Martin Center for Nonproliferation Studies.

the aftermath of the terrorist attacks on 11 September 2001, there was also significant concern that nuclear power plants could be targeted by terrorists using large planes. However, experts have tended to agree that it would be challenging to accurately target such facilities¹⁸³.

As for the probability of a terrorist attack involving radiological materials, it is considered to be somewhat higher than for nuclear agents. This is because radiological weapons are technologically less sophisticated than nuclear weapons and require materials that are relatively easier to access via venues such as hospitals, universities, or industrial facilities. The issue of lost or stolen nuclear or radioactive materials (i.e. 'out of regulatory control') remains a concern across the globe¹⁸⁴. According to the latest update of the James Martin Centre for Nonproliferation Studies (CNS) Global Incidents and Trafficking Database, there were 167 cases of loss of regulatory control over nuclear and other radioactive materials across the world in 2019¹⁸⁵. Nevertheless, one can assess the risk of terrorist use of radiological weapons as low overall. In addition to possessing a certain amount of knowledge and funding, to use such weapons, terrorists would need to have access to sufficient quantities of radioactive material of sufficient strength to build a radiological weapon successfully.

Biological weapons would, in general, be considerably easier to manufacture or acquire than nuclear weapons. A bio-weapon programme could draw upon available dual-use equipment and material. Even if it were to only cause a limited number of casualties, a bio-terror attack could have a significant impact, notably psychologically, politically and economically. However, the weaponisation of a biological agent is generally considered to be highly complex¹⁸⁶.

Finally, as far as chemical weapons are concerned, many of their ingredients are 'dual-use', which makes their preparation easier to conceal. Whilst their production and delivery on a large scale would be challenging, notably because of the high costs, it would be possible to develop, hide and transport low-yield chemical weapons, as seen in the case of the 'Aum Shinrikyo' cult¹⁸⁷. Similarly to biological weapons, even if the number of direct casualties was modest, the use of such a weapon could have a profound impact, notably through creating widespread panic in the targeted and surrounding populations.

Assessing the current threat of CBRN terrorism in Europe

In general, law enforcement bodies in Europe consider that the greatest threat of terrorism from both jihadist and far-right elements currently comes from small cells or lone actors who are acting autonomously¹⁸⁸. It is much more difficult to thwart plots involving one individual (or a small group) compared to those prepared by a larger, more organised group of perpetrators. This is why terrorist propaganda, e.g. by groups such as al Qaeda and the Islamic State, has long encouraged individuals to act autonomously and preferably on their own.

Until recently, a commonly held view was that the greatest threat to the EU emanated from foreign terrorist fighters who had trained in Syria or Iraq and would execute or organise attacks on European soil, likely with chemical weapons. This had become a concern from 2012 onwards. At the time, it was alleged on several

¹⁸³ Parliamentary Office of Science and Technology, *Assessing the Risk of Terrorist Attacks on Nuclear Facilities*, London: Parliamentary Office of Science and Technology, 2004.

¹⁸⁴ G. M. Moore, 'Out of Control: Why Mandatory International Reporting is Needed for Radioactive Sources and Materials', *Bulletin of the Atomic Scientists*, 70(6): 63-72, 2014.

¹⁸⁵ Actually, this number is likely under-estimated, since the vast majority of reported incidents in 2019 (i.e. 83%) occurred in the six countries that mandate the public reporting of such incidents, namely Belgium, Canada, France, Japan, South Korea, and the US (Nuclear Threat Initiative, 'What Do Seven Years of Incident Data Tell Us about Global Nuclear Security?', 2020).

¹⁸⁶ P. Cornish, 'The CBRN System', 2007.

¹⁸⁷ P. Cornish, 'The CBRN System', 2007.

¹⁸⁸ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2020', The Hague, 2020.

occasions that chemical weapons, such as chlorine, sarin and sulphuric mustard agents, had been used in the Syrian conflict, not only by the regime forces but also by the Islamic State¹⁸⁹. Concerns were also expressed over the Islamic State's interest in acquiring CBRN weapons. In particular, it was reported that the Islamic State had 'developed at least a small-scale chemical weapons [programme], and may have manufactured low-quality blister agent or obtained chemical arms from undeclared or abandoned [Syrian] stocks'¹⁹⁰. In an article on the 'chemical arsenal' of the Islamic State, Quillen argued that 'a clearer picture emerges of a dedicated and increasingly successful chemical weapon [programme] that threatens military forces and civilian populations around the world'¹⁹¹. Against that backdrop, concerns grew in the EU that foreign terrorist fighters returning from the Syrian conflict might use chemical weapons against European states¹⁹². In the wake of the terrorist attacks in Paris in November 2015, which did not involve CBRN weapons but were conducted by several terrorists with links to Syria, the French Prime Minister at the time, Manuel Valls, declared the following: 'We must not rule anything out. I say it with all the precautions needed. But we know and bear in mind that there is also a risk of chemical or bacteriological weapons'¹⁹³. In its 2016 European Union Terrorism Situation and Trend (TE-SAT) report, the EU Agency for Law Enforcement Cooperation (Europol) noted that '[the] phenomenon of individuals travelling for terrorist purposes to conflict zones increases the risk that expertise in the use of chemical weapons can be transferred to the European Union by returning foreign terrorist fighters'¹⁹⁴. In addition, Europol has highlighted that CBRN-related topics have regularly been included in online terrorist propaganda¹⁹⁵. Of particular interest is also the agency's observation that there has been a significant increase in the number of tutorials for conducting small-scale CBRN attacks which have been shared on the internet. Such tutorials usually recommend the use of toxic industrial chemicals since those are available in the EU due to their dual-use nature¹⁹⁶.

Thus, in the period 2012-2018, it was perceived that the **main CBRN terrorist threat to the EU and its EU Member States concerned the use of chemical weapons**¹⁹⁷. During this period, the threat emanating from biological, nuclear or radiological weapons received far more limited attention. Moreover, despite the perceived increase in the probability of a chemical attack in the EU, which was considered to likely involve some direct or indirect connection to the Islamic State, the commonly held perception was that **overall, the threat of CBRN terrorism remained low**. At the same time, it was acknowledged that should a CBRN terrorist attack take place. It could **potentially have a very severe impact**. The European Commission summarised it as such in 2017: 'Even at a small scale, a CBRN attack may have a considerable impact on the societies and economies against which they are used, resulting in significant and lasting disruption,

¹⁸⁹ C. McLeish, 'Recasting the Threat of Chemical Terrorism in the EU: The Issue of Returnees from the Syrian Conflict', *European Journal of Risk Regulation*, 8(4): 643-657, 2017; UN News, '[Security Council discusses chemical weapons use in Syria following latest global watchdog report](#)', 2019.

¹⁹⁰ C.J. Chivers, 'What an ISIS Chemical Threat Did to One Syrian Family', *The New York Times*, 2015.

¹⁹¹ C. Quillen, '*The Islamic State's Evolving Chemical Arsenal*', *Studies in Conflict & Terrorism*, 39(11): 1019-1030, 2016.

¹⁹² McLeish, C. (2017) 'Recasting the Threat of Chemical Terrorism in the EU: The Issue of Returnees from the Syrian Conflict', *European Journal of Risk Regulation*, 8(4): 643-657.

¹⁹³ A. Withnall, 'Paris Attacks: Isis "Chemical Weapons" Warning Issued by French PM Manuel Valls', *Independent*, 2015.

¹⁹⁴ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2016' (TE-SAT), The Hague: Europol, 2016, p. 8.

¹⁹⁵ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2018' (TE-SAT), The Hague: Europol, 2018.

¹⁹⁶ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2018' (TE-SAT), The Hague: Europol, 2018.

¹⁹⁷ 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](#), Brussels, 2017, p. 2.

widespread fear and uncertainty'¹⁹⁸. In practice, no terrorist attack involving chemical agents took place during that period in Europe.

Since 2018, the threat perception has evolved, mainly as a result of the weakening of the Islamic State, which has lost considerable territory and assets. Drawing upon the recent assessment of the US Department of Homeland Security¹⁹⁹, it can be argued that international terrorist groups such as the Islamic State and al Qaeda remain interested in perpetrating terrorist attacks in Europe, but their ability to initiate or organise such operations has been severely curtailed following significant international counter-terrorism efforts in recent years. However, there is still a risk of attacks on a smaller scale by individuals or small cells who could be inspired by jihadist ideology. An illustration of this possible threat was provided by the case of an Islamic State sympathiser in Germany who was found guilty of producing a biological weapon and of planning a serious act of violent subversion in 2020. This man, together with his wife, managed to make a small amount of ricin by processing castor beans before being arrested in 2018²⁰⁰.

Another concerning development is the growing threat of far-right CBRN terrorism, although it is important to emphasise that it remains overall limited. A modest, albeit rising, number of far-right extremists have managed to acquire and weaponise CBRN material with a view to using it in a terrorist attack. Although the vast majority of known cases were in the US, several concerned Europe, and particularly the UK²⁰¹. According to Koehler and Popella, 'far-right CBRN terrorism appears to be predominantly a lone-actor phenomenon oftentimes involving middle-aged and comparatively well-educated male perpetrators, mostly motivated by non-religious forms of far-right ideology (i.e. neo-Nazism, non-religious white supremacism) and indiscriminately targeting victims'²⁰². It is important to emphasise that the perpetrators tended to encounter significant problems handling the CBRN materials. As for **radical environmentalists**, a recent study has concluded that they are 'highly unlikely' to engage in CBRN terrorist activities since most are committed to non-violence²⁰³. Nevertheless, there are some violent elements, in particular in green anarchist groups, that may consider the use of CBRN weapons, although they are likely to be hampered in their efforts by their limited capabilities. Thus, **the CBRN threat represented by radical environmentalism today is arguably modest**. Nevertheless, the threat could grow in the future, as some individuals may consider that more drastic action is needed in the face of what they perceive as governmental inaction to tackle the environmental crisis, in particular climate change²⁰⁴. The hardening of the reaction of some European states towards environmental activism, including bans on entry or deportations, may also contribute to strengthening that trend²⁰⁵.

Furthermore, **law enforcement communities in Europe have observed that the use of CBRN weapons continues to be discussed online**. Technological information is exchanged online, whilst propaganda

¹⁹⁸ 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](#), Brussels, 2017, p. 2.

¹⁹⁹ US Department of Homeland Security, Homeland Threat Assessment, October 2020, Washington, DC: US Department of Homeland Security.

²⁰⁰ France 24, 'Tunisian handed ten years for ricin bomb plot in Germany', 2020.

²⁰¹ D. Koehler and P. Popella, 'Mapping Far-right Chemical, Biological, Radiological, and Nuclear (CBRN) Terrorism Efforts in the West: Characteristics of Plots and Perpetrators for Future Threat Assessment', *Terrorism and Political Violence*, 32:8 1666-1690, 2020.

²⁰² D. Koehler and P. Popella, 'Mapping Far-right Chemical, Biological, Radiological, and Nuclear (CBRN) Terrorism Efforts in the West: Characteristics of Plots and Perpetrators for Future Threat Assessment', *Terrorism and Political Violence*, 32:8, 2020, p.1666-1690.

²⁰³ Z. Kallenborn and P. C. Bleek, 'Avatars of the Earth: Radical Environmentalism and Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons', *Studies in Conflict & Terrorism*, 43(5), 2018, p. 368.

²⁰⁴ Z. Kallenborn and P. C. Bleek, 'Avatars of the Earth: Radical Environmentalism and Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons', *Studies in Conflict & Terrorism*, 43(5): 351-381, 2018.

²⁰⁵ P. A. Spadaro, 'Climate Change, Environmental Terrorism, Eco-Terrorism and Emerging Threats', *Journal of Strategic Security*, 13(4): 58-80.

encourages attacks, notably those involving the use of CBRN weapons²⁰⁶. In 2019, in a departure from the focus on **chemical weapons**, pro-Islamic State propaganda promoted the use of **biological weapons** online. Traditionally, handling biological agents has been challenging to terrorists, although technological progress and information-sharing online may have reduced the challenges faced by terrorists²⁰⁷. As for the possible use of radiological weapons in a terrorist attack, there has not been any instance of such an attack in Europe.

4.3.4 Looking towards the future: the possible impact of emerging technologies

Some emerging technologies may facilitate the access of terrorists to CBRN agents, which as a result could increase the likelihood of CBRN terrorist attacks in the future. However, it is important not to overstate this threat, which has been sensationalised in the traditional and social media at times.

Emerging technologies are usually understood to be technologies with new elements that have a significant potential without having developed their full potential yet. Overall, they tend to share a series of characteristics that renders the prevention of their misuse particularly challenging (the so-called '7Ds')²⁰⁸.

Box 0.4 CBRN The '7Ds' of emerging technologies

The '7Ds' of emerging technologies

- 1. Disruptive:** One of the key characteristics of emerging technologies is their disruptive potential in the sense of leading to a significant shift from a prevailing paradigm.
- 2. Dual-use:** These technological advancements can be used for both harmful or peaceful purposes. As a result, it is particularly challenging to control access to them or the knowledge and skills they require for their (mis)use. For instance, drones can save lives in search and rescue operations, but can also be used for carrying weapons.
- 3. Digital:** All emerging technologies have a digital component. This facilitates their sharing but this also makes it extremely challenging to regulate their spread.
- 4. Diffused:** In relation to the previous point, the diffusion of emerging technologies across the globe can take place very fast, making the regulation of their transfer difficult.
- 5. Decentralised:** Scientific innovation and industrial capacity are no longer concentrated in a small set of economies but are decentralised across the world.
- 6. Deskilld:** The level of skill required to manufacture or use emerging technologies has decreased, which has rendered these technologies largely accessible.
- 7. Do-It-Yourself (DIY):** Transnational DIY communities that have emerged with the support of digital tools play a critical role in the development and the application of these emerging technologies. Although the majority of them do not pursue malicious aims, there is a concern that they could be instrumentalised and that their expertise could be misused by others.

With regard to CBRN weapons, advances in several emerging technologies are concerning. This report highlights two emerging technologies that are of particular concern in the short term, namely drones and

²⁰⁶ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2020', The Hague: European Union Agency for Law Enforcement Cooperation, 2020.

²⁰⁷ European Union Agency for Law Enforcement Cooperation, 'European Union Terrorism Situation and Trend Report 2020', The Hague: European Union Agency for Law Enforcement Cooperation, 2020.

²⁰⁸ G.D. Koblenz, 'Emerging Technologies and the Future of CBRN Terrorism', The Washington Quarterly, 43(2): 177-196, 2020.

the Dark Web. Although these technological advances are relevant to both state and non-state actors, emerging technologies can be deemed to be more important to non-state actors in relative terms, as the latter gain new capabilities through them. Hence, the impact of emerging technologies on non-state actors is underlined in this report. Nonetheless, it is acknowledged that state actors may also use them, as they contribute towards increasing states' capabilities as well, also considering that states may even have played a key role in their development.

Drones

Some observers believe that drones (or unmanned aerial vehicles (UAVs)) may have a significant impact on the capabilities of non-state actors, including those considering the use of CBRN materials for a terrorist attack²⁰⁹. This is because drones may enable non-state actors to acquire airborne capability for the first time, thereby challenging the traditional airborne superiority of state actors. In addition to supporting the collection of intelligence, drones can be used for smuggling goods and materials in and out of prisons or across borders, overcoming any physical barriers that have been erected on the ground. Further, drone swarms could be used by non-state actors to conduct CBRN attacks, including on critical infrastructure. However, it is important to keep this threat in perspective and not to give too much credence to the 'dronepocalypse' scenarios that have been flourishing on the internet²¹⁰. For example, the Department of Homeland Security in the US reported that 4,000 activities with drones had been recorded in the vicinity of public gatherings or critical infrastructures in 2019, but none of them were linked to any terrorist group²¹¹. Finally, it is important to point out that although drones may indeed provide terrorists with new capabilities, they also provide authorities, which generally have far greater drone capabilities than terrorists, new tools to address the evolving terrorist threat, notably in the fields of intelligence-gathering and response to emergencies²¹².

The Dark Web

Also known as 'Darknet', the Dark Web is a restricted part of the internet. Its content is not indexed, and it can only be accessed by using unique software, configuration or authorisation to access²¹³. Therefore, it gives significant opportunities for communication and information sharing relating to illegal activities, including on the production or acquisition of CBRN weapons and the planning of terrorist attacks. The Dark Web enables terrorists and criminals to communicate anonymously and securely over the internet. It can also support the acquisition of dual-use materials or equipment, considering that it hosts various marketplaces that offer a range of illegal goods for sale, including guns and CBRN materials. Many such transactions are in turn facilitated by the use of the digital currency Bitcoin, which enables terrorists and criminals to avoid the possible scrutiny of traditional financial systems. These encrypted transactions provide anonymity to all parties and pose a significant challenge to law enforcement. Therefore, some observers are concerned that the Dark Web could bridge the gap that has traditionally separated terrorist groups interested in acquiring CBRN weapons and those who have the skills and expertise necessary to develop them. As argued by Koblenz, '[by] enabling the global, anonymous sale of CBRN-related materials, the Dark Web provides amateur chemists, DIY biologists, and rogue scientists with a means of monetizing

²⁰⁹ G.D. Koblenz, 'Emerging Technologies and the Future of CBRN Terrorism', *The Washington Quarterly*, 43(2): 177-196, 2020.

²¹⁰ B. Ebiri, 'The Dronepocalypse Is Here — in Documentary Footage, at Least', *The New York Times*, 8 May 2019.

²¹¹ M. Normark, et al., *CBRN Threats and Incidents Involving Non-state Actors – 2020 Annual Report*, Stockholm: Swedish Defence Research Agency, 2021, p. 9.

²¹² A. Rabajczyk et al., 'Monitoring of Selected CBRN Threats in the Air in Industrial Areas with the Use of Unmanned Aerial Vehicles', *Atmosphere*, 11, 1373, 2020.

²¹³ FBI, 'A Primer on DarkNet Marketplaces : What they are and what law enforcement is doing to combat them', 2016.

FBI, 'A Primer on DarkNet Marketplaces : What they are and what law enforcement is doing to combat them', 2016.

their skills without having to run the risks associated with working with an [organised] criminal group as a middleman or finding their own customers'²¹⁴.

Box 0.5 CBRN threat from non-state actors – key points

CBRN threat from non-state actors – key points

Overall, the **probability of a terrorist attack involving CBRN agents remains low in Europe**, despite being often sensationalised in the media and on social media.

Amongst the various CBRN weapons available, the use of chemical agents is arguably more likely than that of other agents.

Should a CBRN terrorist attack take place, it is unlikely to be on a large scale.

However, it could still have a significant impact on society, notably because of the considerable anxiety and disruption that it could induce.

Moreover, the attack could be instrumentalised by malicious actors who could spread disinformation.

The risk of a CBRN attack may increase in future as terrorists may take advantage of emerging technologies.

4.4 Conclusion

The CBRN threat landscape has rapidly evolved in the last few years. Concerning the CBRN threat from state actors, a trend of weakening of the main regimes against the CBRN weapons is observable. In the nuclear domain, there has been a trend towards the modernisation of nuclear arsenals of states in possession of nuclear weapons and a growing interest in developing nuclear weapons in some states not (yet) possessing nuclear weapons. In this regard, several non-nuclear-weapon states have actively pursued nuclear weapons (e.g. Iran, North Korea), whilst others have expressed a potential interest in acquiring nuclear weapons (e.g. Turkey, Saudi Arabia). Moreover, a treaty that played a key role in non-proliferation, i.e. the INF, has come to an end, which could have significant consequences for European security. At the same time, the international regime against chemical weapons has been significantly challenged by its repeated violations by Syria, which have remained insufficiently punished to date. As for biological weapons, there have been serious doubts as to Russia's compliance with the BTWC. This points to **a weakening of the norms underpinning these regimes**, which has been confirmed by the use of CBRN weapons by some states, such as Russia, in attempts to assassinate political opponents. These various developments mean that **the risk of proliferation – to other state actors or non-state actors – has been increasing**.

Regarding the CBRN threat from non-state actors, it is **important not to over-inflate the CBRN terrorist threat**, which is regularly sensationalised in both traditional media and on social media. Overall, **the probability of a terrorist attack involving CBRN agents remains low in Europe** due to obstacles in obtaining the necessary CBRN agents and weaponising them. Amongst the various CBRN weapons available, **the use of chemical agents is arguably more likely than that of other agents**, whilst the use of nuclear agents appears the least likely, but all the probabilities considered here are low overall. Taking into account that large-scale terrorist operations involving multiple individuals are more likely to be thwarted by the law enforcement communities and security services, it can be argued that should a CBRN terrorist attack take place, which again is an event having a low probability overall, it is unlikely to be on a

²¹⁴ G.D. Koblentz, 'Emerging Technologies and the Future of CBRN Terrorism', The Washington Quarterly, 43(2): 177-196, 2020, p. 181.

large scale. More probably, it would be an attack carried out by a lone perpetrator or a very small group of individuals. Nevertheless, even a relatively small attack with a limited number of direct casualties could have a significant impact on society because of the fear and considerable anxiety that it could induce. There could also be major socio-economic disruptions, as, for example, transportation networks and businesses could be affected. Moreover, such a potential attack could be instrumentalised by malicious actors who could spread disinformation. This could render the response to the attack, including by first responders, more complicated since parts of the population might not trust the information given by the authorities or may refuse to follow instructions. Some observers also argue that the risk of a CBRN attack is likely to increase in future as terrorists may take advantage of possibilities offered through emerging technologies, such as drones and the Dark Web. The risks associated with such developments should not be exaggerated, though, as state actors also benefit from these emerging technologies when developing their response to the CBRN threat.

5 State of play of the EU's preparedness regarding CBRN threats

The tools available to the EU to face CBRN threats range from **legal frameworks and instruments** to **operational capabilities and mechanisms**. They also relate to the **relationships** that the EU has with external partners, including States, international organisations, and other entities. This Chapter first addresses the context for EU actions and recent experiences in the framework of the COVID-19 pandemic. It then addresses the response tools of the EU and the EU Member States, including the role of EU Member States in mitigating CBRN threats. It will then address mechanisms at the EU level, the EU's relationship with NATO in the field of CBRN, international collaborations with the UN and relevant international organisations, the relationship with the private sector, and other identified EU tools. The analysis will consider relevant policies, coordination mechanisms, issues related to operational preparedness, the development and implementation of technological solutions, engagement with industry, science and innovation in support of CBRN preparedness, the development and harmonisation of procedures used in response systems, as well as training (specialised and interoperability) and exercises at different levels. CBRN resilience in the EU also requires looking at practical issues such as interoperability and compatibility of standards as well as public communication and alert systems. This discussion will lead into the formulations of recommendations, including on measures that the European Parliament may wish to consider to strengthen CBRN threat resistance in the EU. Such measures may include participation in legislative processes where legislative action may be required or proposed by the EP, proposals with regard to scrutiny over the CFSP, or initiatives with regard to the development of new policy initiatives and/or future measures through pilot projects or preparatory actions.

5.1 Legal and organisational framework for EU actions

The actions of the EU and its Member States to counter threats emanating from CBRN weapons and materials are embedded in the wider context of the existing and still evolving norms. These include previously addressed international instruments relating to specific aspects of CBRN (see Section 4.1), treaties in the field of arms control pertaining to WMD and international counter-terrorism instruments, as well as mechanisms to prevent the proliferation of CBRN materials, equipment, technologies and knowledge destined for hostile purposes. More recently, instruments and mechanisms adopted in the context of international criminal law (the Rome Statutes of the International Criminal Court, including its amendments) and mechanisms under international humanitarian law are also relevant. The relevant legal framework overlaps in certain areas with regulations based on environmental and safety legislation, for example, when it comes to transborder movements of hazardous materials.

Furthermore, EU policies and actions are aligned with decisions taken in the context of the Australia Group to prevent the proliferation of chemical and biological weapons through export controls applied to sensitive materials, equipment, technologies and intangibles. Policies and measures adopted in both the UN context and outside it regarding sanctions against perpetrators who have used CBRN weapons or contributed to their proliferation are also important. These include the Partnership against Impunity for the Use of Chemical Weapons²¹⁵ and the EU's chemical weapons sanctions regime²¹⁶.

As indicated previously, primary responsibility for internal security lies with EU Member States. The same applies to organising and delivering health services and medical care. However, the new EU Security Union Strategy recognizes that 'Citizens cannot be protected only through Member States acting on their own [and that] recent years have brought an increasing understanding that the security of one Member State is the security of all'²¹⁷. In this regard, CBRN events may overwhelm EU Member States' response capacity, and they may affect more than one EU Member State. Thus, responses to CBRN events might require cross-border or broader European coordination and solidarity and might also require cooperation with actors outside the EU. Accordingly, EU institutions also have an important role to play when it comes to responding to CBRN threats.

*The new strategy lays the 'foundations for a security ecosystem that spans the entire breadth of European society. It is grounded in the knowledge that security is a shared responsibility. Security is an issue that affects everyone. All government bodies, businesses, social organisations, institutions and citizens must fulfil their own responsibilities to make our societies more secure'*²¹⁸.

Being cross-sectoral and multidisciplinary in nature, CBRN issues are dealt with by a range of EU entities and are aligned with several EU decisions and directives, including the 2017 EU Directive on combating terrorism²¹⁹. Among other obligations, this Directive requires EU Member States to include specific terrorist offences into their national legislation. Such offences include, inter alia, the manufacturing, possession, acquisition, transport, supply or use of explosives or weapons, including CBRN weapons, as well as research into and development of CBRN weapons. It also contains provisions on assistance and support for victims.

In a 2020 report on the Directive²²⁰, the European Commission noted several deficiencies in transposing the Directive into national legislation but also concluded that national measures nonetheless appear to be largely in line with the Directive. In the same year, the European Commission set out its most recent Counter-Terrorism Agenda for the EU (anticipate, prevent, protect, respond), noting that 'the risk from chemical, biological, radiological and nuclear (CBRN) materials remain[s] a concern'²²¹. Within this agenda, the European Commission prioritised measures to mitigate risks related to certain chemical agents, as well

²¹⁵ Chemical Weapons No Impunity, [website](#).

²¹⁶ C. Portela, E. Moret, [The EU's Chemical Weapons Sanction Regime](#), European Union Institute for Security Studies, 2020.

²¹⁷ European Commission, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on the EU Security Union Strategy, [COM\(2020\)605](#), p.1.

²¹⁸ [COM\(2020\)605](#) final, p. 26.

²¹⁹ [Directive \(EU\) 2017/541](#) of the European Parliament and of the Council of 15 March 2017 on combating terrorism and replacing Council Framework Decision 2002/475/JHA and amending Council Decision 2005/671/JHA, OJ L 88, 31.3.2017, p. 6–21).

²²⁰ Report from the Commission to the European Parliament and the Council based on Article 29(1) of Directive (EU) 2017/541 of the European Parliament and of the Council of 15 March 2017 on combating terrorism and replacing Council Framework Decision 2002/475/JHA and amending Council Decision 2005/671/JHA, [COM\(2020\)619](#) final, 2020.

²²¹ European Commission, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions A Counter-Terrorism Agenda for the EU: Anticipate, Prevent, Protect, Respond, [COM\(2020\)795](#) final, p. 15.

as noted a need to enhance biosecurity. Other areas of concern include the security of radioactive sources in public health facilities and CBRN risks related to mass gatherings in public spaces.

5.1.1 Recent experiences with EU preparedness and response against a CBRN crisis: COVID-19

Before addressing the response tools, gaps in the EU's response and relating this to the updated threat landscape in more detail, recent practical experiences with the EU preparedness and response mechanisms will be addressed in light of the ongoing COVID-19 pandemic.

As a baseline, and in line with Chapter 4, the CBRN threat landscape is constantly evolving, and as such, the tools and mechanisms put in place by the EU and its Member States require regular review and adaptation in the light of continuing practical experiences and evolving challenges. This has become evident again during the COVID-19 pandemic. This experience demonstrated the value of cooperation between and solidarity among EU Member States. It also highlighted the added value that can be played by the EU through its institutions and coordination mechanisms. However, the pandemic also exposed weaknesses in the national response systems and in the ability of the EU to coordinate efforts across the EU. These include a lack of consultation and coordination among Member States during the early phase of the pandemic (for example, with regard to border closures), a lack of direction from the European Commission about how the crisis ought to be managed, and the absence of a common approach to procurement and stockpile management for critical items, such as masks, other PPE, hydro-alcoholic gel, and ventilators. It also exposed structural weaknesses, such as overdependence on manufacturers and suppliers outside the EU (vaccines, treatments, PPE) and insufficient intra-EU manufacturing capacities that could only be ramped up to the requirements over time.

These difficulties faced by the EU also hampered efforts led by the WHO to develop and implement the global response to the COVID-19 pandemic. Despite undeniable achievements in the fight against the pandemic, limitations were exposed in the international systems with regard to ensuring equitable access to key items such as vaccines²²², or the ability to investigate the origin of major disease outbreaks independently²²³.

As the pandemic progressed, the EU became more active in providing guidance to EU Member States. It took steps to stabilise the supply of vaccines and facilitate the licensing of vaccines through a common approach under the EMA; it banned arrivals from certain countries where variants of the virus had evolved that posed a higher transmission risk or might compromise available vaccines and/or treatments; it also provided significant financial assistance to EU Member States to support their actions in health management and to accelerate economic recovery.

The pandemic again underlines the need to strengthen the resilience of the EU to CBRN threats, including by adopting an all-hazards approach to preparedness and response. COVID-19, of course, was not a deliberate release of a biological weapon. While caution is needed in drawing lessons from the pandemic for CBRN preparedness, one nevertheless must conclude that it has exposed critical shortfalls and underlined the need for better coordination and effective use of existing tools such as joint investigation or response teams. It was a stern reminder of the threat potential inherent in CBRN materials.

The pandemic also had a direct impact on European security and defence. A recent study commissioned by the SEDE Committee highlighted the lack of preparedness of CSDP missions and operations, the

²²² For a status on the global efforts under WHO guidance to develop tools to fight the pandemic and to make vaccines available on an equitable basis, see [WHO website](#).

²²³ For a detailed discussion see Nicolas Wade "[The origin of COVID: Did people or nature open Pandora's box at Wuhan?](#)" Bulletin of the Atomic Scientist, 2021.

European Commission, EEAS and EU Member States, as well as between the EU and NATO²²⁴. At the same time, the study observed the unusually proactive and leading role that the EEAS played during the crisis. It stressed the need for the EU to embark on its own lessons learning with sufficient seriousness, openness and resources, and encouraged the EEAS to foster learning among EU Member States and identify, adapt and diffuse best practices in certain key areas.

5.2 Available Response Tools of the EU and its Member States

5.2.1 EU Member States capabilities

EU Member States have different views and perceptions on the CBRN threats they face and have opted for different levels of preparedness²²⁵. These differences also manifest in the varying levels of cross-organisational training and exercises that national response organisations engage in and the degree of interoperability of procedures, equipment, and communications systems and procedures.

In principle, capacity building in the CBRN area within the EU is based on risk assessment. Robust risk assessment includes assessments of how high-risk CBRN materials and facilities are secured, whether staff 'live' a security culture, how secure transport systems are, and how secure and efficient information and communications can be exchanged. It also includes the efficacy of import and export regimes and the level of cooperation on the security of nuclear materials²²⁶.

However, the differences in perceptions, capabilities and priorities lead to differences in policies, procedures, mechanisms and equipment used/employed by EU Member States. There appears to be a need for a common methodology for CBRN risk assessment by EU Member States and EU institutions. This remains lacking, although some efforts are underway to develop such a common methodology. An example is the project MASC on CBRN risks mapping (still in progress)²²⁷. EU Member States have attempted to enhance and harmonise their capacity to detect, prepare for and respond to CBRN incidents with the adoption of a dedicated action plan in 2009. The 2012 progress report on the implementation of this EU CBRN Action Plan²²⁸ reported progress in its implementation by EU Member States and at EU level, pointing to accomplishments such as agreed lists of high-risk materials, good practices in security training and education, EU guidelines for minimum security training requirements, and scenarios for CBRN detection and emergency response plans, amongst others. Europol was facilitating communications in response scenarios between EU Member States. However, the review also concluded that the implementation of the Action Plan was uneven across EU Member States, thus highlighting the need for a more strategic and overarching approach. As will be addressed in further detail in Section 5.2.2 below, a

²²⁴ European Parliament, [How the COVID-19 crisis has affected security and defence-related aspects of the EU](#), new in-depth analysis for the SEDE Committee, 2021.

²²⁵ S.N. Chatfield, "Member State's Preparedness for CBRN Threats – Terrorism" TERR Committee Report, 2018. The study uses data from Booz Allen Hamilton (2017). The 2018 study by the TERR Committee study looked at the level of preparedness for CBRN incidents of several EU countries relative to the respective threat level. This analysis evaluated threat and preparedness based on 24 indices grouped into six categories (terrorist threat; CBRN(E) incident and attacks; Emerging Infectious Disease(EID) threat; material access and targets; CBN State conflict; response/preparedness capacity; NB: At State level 'R' conflict scenarios are not considered to be relevant.). Countries reviewed in that analysis included the Netherlands, Poland, Italy, Belgium, France, Germany, the United Kingdom, and a group of Scandinavian countries. The study confirmed that there are significant differences between those countries in terms of threat perception, actual CBRN threat score, and degree of preparedness for CBRN threats in terms of detection, response and mitigation capabilities.

²²⁶ Adapted from CoU Policy Themes – CBRN threats, Security Research [webpage](#).

²²⁷ Methodology for Assessing States' Capacity for Countering the Hostile Misuse of CBRN Knowledge and Materials (MASC-CBRN), [webpage](#).

²²⁸ European Commission, [Progress Report on the Implementation of the EU CBRN action plan](#), 2012.

second CBRN Action Plan was subsequently adopted in 2017²²⁹, which entailed a shift from a comprehensive all-hazard approach to a more focused, prioritised, and more strongly security-oriented approach under the lead of DG HOME. In 2020, based on EU Member States' self-assessment, the first progress report on the implementation of this new Action Plan²³⁰ reported:

'The overall conclusion was that a majority of actions have been implemented. At the beginning of 2020, the European Commission, in cooperation with national experts, established a list of high-risk chemicals of concern. This was the basis for engagement with equipment manufacturers with a view to improving detection capabilities. Recently, the European Commission launched a study into the feasibility of restricting access to some of these chemicals. Work is also on-going as part of the Union Civil Protection Mechanism, and additional CBRN response capacities are being discussed with Member States in the fields of Decontamination, Detection, Surveillance and Monitoring, as well as stockpiling.'

This assessment appears to be appropriate in the context of CBRN threats associated with non-state actors, but it will surely have to be reviewed in the light of biological risks of natural origin that have the potential of resulting in a major international public health crisis, such as another pandemic.

An important longer-term dimension of CBRN resilience is to develop a strong science and technology basis in the EU Member States in order to respond to the evolving CBRN challenges and to offer new, innovative solutions such as detection equipment, forensic investigation methods, medical countermeasures and decontamination techniques. EU Member States have benefitted from EU frameworks and funding aimed at strengthening the research and development basis for CBRN defence. The EU framework programme for Research and Innovation for the period 2014 – 2020 (Horizon 2020) has increased the amount allocated to security to EUR 1.65 billion²³¹. It aims at improving methods for detection, decontamination and training. Project EDEN (End-user driven **DE**mo for cbr**Ne**), European CBRN Innovation for the Market Cluster (ENCIRCLE) and the establishment of the CoU are other examples of initiatives funded by the EU that have facilitated cooperation between EU Member States, as well as between governments, research and development centres with high CBRN innovation potential, and industry.

Another issue that affects EU Member States preparedness is the procurement of critical items such as PPE, protective equipment, medicines and other medical supplies, non-medical equipment required in a crisis response, etc.). Some progress has been made with respect to the JPM²³², which establishes in Art. 5 a joint procurement procedure for medical countermeasures in case of serious cross-border health threats. DG SANTE manages the procurement process, identifying and negotiating procurement contracts on behalf of interested EU Member States. This should result in EU Member States securing more equitable access to medical countermeasures and improved security of supply, together with more balanced prices for the participating EU Member States. No specific reference is made to CBRN incidents as a trigger for the

²²⁹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee on Regions Of 18 October 2017 on the Action Plan to enhance preparedness against chemical, biological, radiological and Nuclear security risks ([COM\(2017\) 610](#) final).

²³⁰ European Commission, Communication from the Commission to the European Parliament and the Council, First Progress Report on the EU Security Union Strategy [COM\(2020\)797](#) 1st progress report.

²³¹ Regulation (EU) No [1291/2013](#) of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC, OJ L 347, 20.12.2013, p. 104–173.

²³² Decision No [1082/2013/EU](#) of the European Parliament and of the Council of 22 October 2013 on serious cross-border threats to health and repealing Decision No 2119/98/EC on serious cross-border threats to health and repealing Decision No 2119/98/EC.

application of these provisions, but the joint procedure makes explicit reference to vaccines, antivirals and medical countermeasures for serious cross border health threats. Some of the difficulties of applying these procedures in praxis were experienced in particular during the initial phase of the COVID-19 pandemic. It has been recognised that the JPM needs strengthening to make it more attractive for EU Member States and suppliers. There is also a recognised need to establish strategic stockpiles of medical countermeasures and more cooperation with industry. A key lesson so far has been that it is imperative that first responders get better protection.

Many of these gaps are not new – they have been identified well before COVID-19. A report prepared for the TERR committee in 2018²³³ and a two-day joint workshop on EU-NATO cooperation in civil protection organised in 2019 by the Romanian Presidency of the Council of the European Union and the European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE)²³⁴ are examples to this end. These and other studies identified capacity gaps and uncertainties in the treatment of victims of CBRN attacks, inadequate national stockpiles of medical countermeasures, dependency on US assistance under the Global Health Security Initiative, gaps in the protection of first responders, and a lack of engagement with industry to ensure flexibility to quickly adapt output to create a surge capacity for new products needed in an emergency. The only viable solution was to establish central or regional stockpiles of specialist countermeasures ahead of an incident occurring, and an example to this end is the US Strategic National Stockpile managed by the CDC. However, that would require EU Member States to transfer more financial and operational power to the European Commission. It took until March 2020 that the first-ever rescEU stockpile of medical equipment was created by the European Commission²³⁵, including such items as intensive care medical equipment including respirators, PPE including reusable masks, vaccines and therapeutic, and laboratory supplies.

In sum, EU Member States continue to have different perceptions about the CBRN threat level they face and about the amount of money, time and effort they need to invest in preventing CBRN incidents. The efforts they have invested in responding to them when they happen and mitigating their consequences also differ. What is more, CBRN protection and defence is a highly competitive market, and EU Member States remain in strong competition for market segments. Whilst this may be desirable from a competitiveness point of view, it stands in the way of common standards, interoperability of equipment and procedures, as well as information exchanges on sensitive issues, since EU Member States tend to favour their own, often indigenous supplier, and technical specifications and requirements are often different between the suppliers across the EU Member States.

There are also significant differences in EU Member States' expectations vis-a-vis the role that European bodies (European Commission, EU agencies and Services, Council, and Parliament) should play in a major crisis and the level of authority that should be vested in such bodies for coordination and direction in the event of a crisis. While the initial phase of the COVID-19 crisis exposed many of these pitfalls, the management in subsequent months demonstrated that the EU can indeed operate as 'Team Europe'. It will be crucial for CBRN resilience in the EU and its Member States to learn these lessons for the pandemic response and build them back into the regulations, coordination mechanisms and operational practices of the different actors at both the national and EU level.

5.2.2 The 2017 CBRN Action Plan

The initial (2009) CBRN Action Plan of the EU was an effort to develop a comprehensive, all-encompassing risk management approach. This was inspired by the understanding that CBRN risk mitigation needs to be all-hazards in scope (addressing threats emanating from natural, accidental and hostile origins), and

²³³ S.N Chatfield, "Member State's Preparedness for CBRN Threats – Terrorism" TERR Committee Report, 2018.

²³⁴ Hybrid CoE, Medical-based scenario highlights significance of EU Civil Protection Mechanism, 2019.

²³⁵ European Cluster Collaboration Platform, European Commission creates first ever rescEU stockpile of medical equipment, 2020.

therefore needed a multi-stakeholder approach that would involve a broad range of EU actors from a range of sectors as well as with cross-sectoral responsibilities. To a degree, this approach was subsequently mirrored in the EU's CBRN Centres of Excellence Initiative, through which partner countries are encouraged to set up inter-ministerial national CBRN teams and eventually engage in cross-sectoral needs assessments leading to the development of national action plans. The approach also responded to what European countries had been working towards in response to the UNSC resolution 1540 (2004), which compels countries to implement measures to prohibit and prevent the proliferation of CBRN weapons and materials, equipment and technologies to non-state actors.

Despite progress in the implementation of the goals under the first CBRN Action Plan, however, a longer-term strategic vision was missing, and there were concerns that the implementation of the Action Plan lacked a sense of priority, also in terms of longer-term efforts and continuity after the tasks set in the action plan had been accomplished. However, a second CBRN Action Plan was adopted in 2017 after a period of consultations between EU Member States and the European Commission. It was anchored the lead on security-related actions firmly in DG HOME. The new Action Plan was part of a wider Counterterrorism Package adopted by the EU, and within DG HOME was seen in the broader context of the protection of citizens in public places. Within this broader framework, however, CBRN threats were not given high priority. This was due to the fact that, despite certain indications that terrorists were showing an interest in CBRN weapons acquisition, there were no actual terrorist attacks with CBRN weapons in Europe. The lead in DG HOME also meant that the all-hazards approach of CBRN threat preparedness received less emphasis.

However, the 2017 Action Plan did emphasise a need, in addition to cross-border cooperation, to enhance cross-sectoral cooperation. There is a view within the European Commission that cross-sectoral cooperation is working well at EU level. Staff from the different DGs with responsibility in the CBRN area (including DGs HOME, ECHO, SANTE, TAXUD, INTPA, JRC, TRADE, GROW) as well as the EEAS and the Service for Foreign Policy Instruments (FPI) exchange information and meet regularly at working level, today in the context of the 'Security Union Task Force' framework and its subgroup on CBRN. However, it remains unclear how far this cooperation reaches beyond information exchanges and extends into joint programming of activities. Under the new Counterterrorism Agenda adopted in December 2020, and informed by some actual cases of planned and partially executed terrorist attacks, DG HOME has identified two priority issues – both cross-sectoral with DG HOME in the lead: prevention and response to terrorist attacks using certain types of toxic chemicals, and bioterrorist attacks in particular with regard to insider threats.

In practical terms, the work under the 2017 Action Plan has resulted in a number of practical accomplishments, such as the development of analytical tools and agreed lists of threat agents. One example being the biosecurity resources toolbox²³⁶ which has been developed for the benefit of EU Member States and other audiences; it includes interactive tools to mitigate insider threats at strategic and sensitive industries, checklists for the identification of vulnerabilities for strategic industries that house CBRN and dual-use items, and documents related to legislation, guidelines, and best practices concerning biosecurity. The thematic areas covered include guidance and best practices, awareness-raising, biosafety and biosecurity training, legislation, policy and codes, a self-assessment tool, and guidance on risk and threat assessment and management.

In addition to concerns about biosecurity, there are apprehensions about the accessibility of radioactive sources that are being used for legitimate purposes, for example in public health facilities. An example of efforts to address this concern is the training offered by the Joint Research Centre (JRC) at the Nuclear Security Training Centre in Karlsruhe (Germany) and Ispra (Italy). The centre was established under the 2009

²³⁶ European Biosecurity Regulators Forum – EBRF, [Biosecurity Resource Toolbox](#); European Commission, [Biosecurity Research Toolbox presentation](#).

CBRN Action Plan to address concerns of theft of radioactive materials that could then be associated with crime and acts of terrorism. Training areas for the European Nuclear Security Training Centre (EUSECTRA) include border detection, mobile detection, covert search, train-the-trainers, mobile response (i.e., Mobile Expert Support Teams (MEST)), reach-back, creation of national response plans, nuclear forensics, radiological crime scene management, nuclear security awareness and sustainability of a national nuclear security posture. The training centre also benefits from collaborations through the Border Monitoring Working Group and the Nuclear Forensics International Technical Working Group and has been developing training schemes including exercises for front line officers, first responders, measurement expert support teams and nuclear forensic experts. Reference and standardised training materials were developed in close collaboration with international partners, including the IAEA, US-DoE, FBI, NFI, CEA, to integrate different available modules into a coherent and comprehensive set of training courses.

With regard to chemical threats, the European Commission is studying possible measures to regulate access to certain dangerous chemicals in ways comparable to the regulations for explosives precursors to control and restrict access. This work is planned to be finalised in 2021²³⁷.

In November 2019, the European Commission invited EU Member States to assess the implementation of the 2017 Action Plan to enhance preparedness against chemical, biological, radiological and nuclear (CBRN) risks²³⁸. The overall conclusion was that a majority of actions had been implemented. At the beginning of 2020, the European Commission, in cooperation with national experts, established a list of high-risk chemicals of concern. This was the basis for engagement with equipment manufacturers with a view to improving detection capabilities. Recently, the European Commission launched a study into the feasibility of restricting access to some of these chemicals. Work is also ongoing as part of the Union Civil Protection Mechanism and rescEU, and additional CBRN response capacities are being discussed with Member States in the fields of Decontamination, Detection, Surveillance and Monitoring, as well as stockpiling. Additional projects, including exercises, are under preparation with regard to external border controls, CB threats at public places such as shopping malls or sports events.

Despite these good examples, it is clear that within DG HOME, and hence regarding issues related to security and protection of populations against criminal and terrorist threats, CBRN threats are not of high priority. With an Action Plan more strongly focussed on security threats rather than taking an all-hazards approach, the EU response capacity is affected by a lack of resources at DG HOME, and there are challenges with regard to ensuring overall leadership across the entire CBRN spectrum. The focus on security also limits the ability to cooperate with external actors (even with regard to NATO where cooperation with DG ECHO and the UCPM works well, but joint exercises with DG HOME and involving EU Member States have been difficult or impossible given the sensitivities involved). Such cooperation is instead channelled through the CBRN CoE Initiative, which has generally made it more difficult to benefit from a closer linkage between internal and external actions in the CBRN domain.

The experience to date makes clear that EU Member States remain reluctant to grant the European Commission with additional competences and authority in this sensitive area, and that this is at least in part due to the differing priorities, security risk perceptions and administrative procedures. This is not dissimilar to the situation in public health (here, too, EU Member States have primary competence over policy settings and operational measures) prior to the COVID-19 crisis, where it took a major global, and thus also pan-European, crisis to create a sufficient degree of political will to strengthen EU-level mechanisms in certain areas, such as centralised stockpiles, EU lead over procurement, or medicine/vaccine licensing.

²³⁷ [COM\(2020\)605](#).

²³⁸ [COM\(2020\)797](#)-1st implementation report.

5.2.3 Common Security and Defence Policy (CSDP)

CSDP Missions

The CSDP provides a role for the EU in peacekeeping, conflict prevention, and the strengthening of international security (Art. 42-1 TEU). [CSDP Missions](#) draw on civilian and military assets for missions to this end, outside the territory of the EU. Since 2003, the EU has undertaken 36 overseas operations using civilian and military missions and operations in several countries in Europe, Africa and Asia. At the time of writing, 17 CSDP missions and operations are ongoing, of which 11 are civilian and 6 military²³⁹. With respect to enhancing capacity in partner countries to mitigate CBRN threats, only one mission appears to have focused on this issue in recent years: the EU Border Assistance Mission (EUBAM) Moldova-Ukraine. This mission has implemented two joint operations (Janus and Orion) involving partner services, the EU and EU Member States' law enforcement bodies with the aim to tackle, inter alia, the trafficking of weapons, ammunition, explosives, and CBRN materials²⁴⁰.

On the other hand, all missions may have to operate in circumstances when they themselves might come under threat of a CBRN attack. The COVID-19 pandemic, although not a deliberate release of a biological agent according to a WHO investigation²⁴¹, exposed certain vulnerabilities of personnel and units employed in CSDP Missions. Particularly affected were the training missions in Mali, Somalia and the Central African Republic. A recent study²⁴² reported a range of issues that need to be addressed and observed that missions and operations were not prepared for such a contingency in terms of planning or capabilities, including adequate medical staff, particularly the civilian and training missions. COVID-19 has accentuated already recognised capacity shortfalls of the CSDP, for instance, in terms of strategic airlift, secure communications and intelligence sharing, command and control, and in EU Member States meeting their force generation commitments for missions and operations. The crisis also again highlighted coordination difficulties between the European Commission, the EEAS and EU Member States, as well as between NATO and the EU. At the same time, it was recognised that the EEAS played an unusually proactive and leading role in helping EU Member States share information and adjust to the pandemic's security and defence implications.

The European Defence Agency

The European Defence Agency (EDA) was established to support the Council and the Member States in their effort to improve the EU's defence capabilities in the field of crisis management and to sustain the European Security and Defence Policy (ESDP) – the term used for the CSDP before the Lisbon Treaty entered into force in 2009 – as it stands now and develops in the future. The EDA is, in fact, an organisation that works at the forefront of European defence in order to better anticipate crises that could impact EU Member States in the event of a major crisis. Examples of its work relevant to this report are the Smart Future Counter-Improvised Explosive Devices Field Laboratory, a project launched in 2020 that offers cooperation and information sharing opportunities, including with respect to the stand-off detection of CBRNE substances. EDA also cooperates with the European Space Agency in a new project regarding CBRNE materials²⁴³.

PESCO

In light of a changing security environment, the EU Global Strategy for Foreign and Security Policy (EUGS) started a process of closer cooperation in security and defence. As a crucial step towards strengthening the

²³⁹ European External Action Service, #EUinAction [webpage](#).

²⁴⁰ European External Action Service, "European Union Common Security and Defence Policy Missions and Operations" Annual Report 2018.

²⁴¹ World Health Organisation, WHO-convened [Global Study](#) of the Origins of SARS-CoV-2 (including annexes), 2021

²⁴² European Parliament, Report on Covid and Security/Defence, 2021.

²⁴³ EDA Annual Report, 2020, p. 6, 13.

CSDP, EU Member States acknowledged the need for enhanced coordination, increased investment and more cooperation in developing defence capabilities. The permanent structured cooperation (PESCO) is a provision of the Lisbon Treaty which introduces the possibility for a nucleus of States of the European Union to develop their collaboration in the field of defence. It was activated in 2017 by a group of 25 EU Member States.

PESCO is based on the concept of differentiated integration, which allows a group of countries to make reciprocal commitments relating to increasing and coordinating their defence spending, participating in European cooperation armament programmes and strengthening the operational capacities of their armed forces. Different from other forms of cooperation among EU Member States, the 25 EU Member States that participate in PESCO have accepted commitments that are legally binding²⁴⁴.

Among the 47 projects currently listed on the PESCO website, two are directly related to CBRN threats: the first is the CBRN Defence Training Range (CBRNDTR), coordinated by Romania. The training range is designed to provide individual and collective CBRN defence training at EU level, both in simulated and live conditions, in order to increase the interoperability between EU Member States. It conducts training activities and tactical exercises as countermeasures to the current and persistent CBRN threats. Its implementation will support the specific needs for military training and evaluation of CBRN defence personnel assigned to EU Battlegroups (EU BGs) or participating in CSDP missions and operations. European CBRN defence companies can use the facilities to test new CBRN defence equipment and technologies²⁴⁵. The second project is the project on Chemical, Biological, Radiological and Nuclear Surveillance as a service (CBRNSaaS). The project is coordinated by Austria and also involves Croatia, Hungary and Slovenia²⁴⁶. It was established as an EDA ad hoc project in November 2020 and remains open to other EDA Member States countries.

However, progress under PESCO has been slow, and in 2020, the strategic review of PESCO recognised that of these 47 projects, only three had reached initial operational capability (IOC), another 23 were expected to do so during 2020-2023²⁴⁷. No updated information is available on the CBRNDTR coordinated by Romania. Regarding the CBRNSaaS project, practical work has started, and a fully functional technical demonstrator is planned to be available by spring 2023²⁴⁸.

One other project that also covers aspects of CBRN threat mitigation and that has made good progress towards IOC is the European Medical Command, a project involving 15 of the 25 participating Member States and coordinated by Germany. 14 nations declared IOC for the MMCC/EMC in September 2019. At the same time, the two former medical service projects MMCC and EMC were merged into one entity (MMCC/EMC). At the time of writing, 18 nations have joined and signed the joint Initial Operational Capability declaration. Six countries (Germany, the Netherlands, Luxembourg, France, Belgium and Hungary) already provide permanent staff for the MMCC/EMC. In addition, the US provides a liaison officer from USAREUR one day per week. Achievement of Full Operational Capability (FOC) is planned for December 2021. The MMCC/EMC deals conceptually with medical countermeasures, decontamination and detection in CBRN incidents. A concrete integration/coordination in the handling of CBRN incidents is not yet within the scope of possibilities at the present time. In the past year, lists of antidotes for the most common C warfare agents and for protective medicines for nuclear/radiological substances were drawn up and agreed upon by the member nations. Two projects are planned for the next months/years: a

²⁴⁴ Consolidated version of the Treaty on European Union - PROTOCOLS - Protocol (No 10) on permanent structured cooperation established by Article 42 of the Treaty on European Union, OJ C 115 09.05.2008 p. 0275, 2008.

²⁴⁵ PESCO, [webpage](#) on CBRN DEFENCE TRAINING RANGE (CBRNDTR).

²⁴⁶ PESCO, [webpage](#) on Chemical, Biological, Radiological and Nuclear (CBRN) Surveillance as a Service (CBRNSaaS).

²⁴⁷ N. Pouzyreff and M. Tarabot, "Is PESCO able to reinforce the credibility of the Common Defence and Security Policy?" *The European Vol. 38* (# 1 2021), 2021, pp. 12-13.

²⁴⁸ European Defence Agency, CBRN SaaS project enters operational phase [webpage](#), 2021.

concept for a modular multinational deployed outbreak investigation team (DOIT), possibly in cooperation with representatives of the Benelux countries; and a conceptual development of a light wounded and material decontamination facility. Networking with the relevant experts and expert committees would be desirable to discuss ideas, projects and results at the European working level²⁴⁹.

PESCO, with its link to the European Defence Fund (EDF), has been described as a novel and important pathway to increased defence cooperation and integration, and ultimately towards a real form of European Defence provide that sustained political will prevails among participating Member States to deliver actual results in terms of capabilities, operations and strategic culture²⁵⁰.

In terms of CBRN defence, it seems as if the EU must move closer to NATO structures. Complementing the work already ongoing on the EMC, and as appropriate making use of the other CBRN-related PESCO projects, this approach could lead to the establishment of a multinational intervention element (an operational task force) in the event of a major CBRN crisis occurring in Europe. According to their possibilities, Member States could contribute to the setting up of this CBRN task force, which should include elements of CBRN reconnaissance (detection/identification), decontamination, and specific medical countermeasures.

Building on this, several recommendations relating to exploring the involvement of EU military capacities and in which circumstances this might theoretically be desirable were made in 2019²⁵¹. They expect an added value of the use of military capacities, considering that armed forces benefit from a comprehensive capability-based planning approach and may also rely on staff that have undergone regular CBRN training. Besides, military capabilities include specialised niche competencies, e.g. medical expertise regarding the treatment of chemical or biological casualties, detection and identification of non-conventional warfare agents, or decontamination. It was recommended that a series of criteria should be established which, if fulfilled, could prompt the involvement of EU military capacity²⁵². More practically, a range of preparatory actions were suggested, whereby first and foremost, EU Member States should be consulted to assess their perception of the possible use of military assets, their expectations and the military capacities they could provide in case of CBRN incidents²⁵³. On the basis of the consultation, prior planning should be defined. More specifically, it was recommended to adjust the training of military staff and their capabilities, so they can adapt more easily to the requirements of civilian interventions, and that exercises should be organised at the European level to train responders according to a common doctrine for intervention in a civilian environment. Likewise, joint preparation of EU civilian and military actors involved in CBRN response should be conducted, including through focused scenario-based discussions and training²⁵⁴. Similar to the training and joint exercise components, it was suggested to set up military modules similar to the models provided to the EU Civil Protection Mechanism but centred on key specific competencies held by armed forces, e.g. medical expertise to address CBRN events, decontamination²⁵⁵.

²⁴⁹ Written communication WC03.

²⁵⁰ A. Marrone "Permanent Structured Cooperation: An Institutional pathway for European Defence" Istituto Affari Internazionali (IAI), 2017.

²⁵¹ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019.

²⁵² Examples of possible criteria include: crisis dynamics, number of EU Member States and/or neighbouring countries that would be affected, scale of the incident, number of casualties, pattern of incidents, response capacities of affected EU Member States, the need for highly specialised teams and equipment, et cetera.

²⁵³ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p. 11.

²⁵⁴ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p. 11.

²⁵⁵ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p. 12.

Box 0.6 Key points on CSDP

Key points on CSDP

The CSDP has come under some scrutiny in recent years, with analysts pointing to insufficient contributions by EU Member States to CSDP missions and operations, a lack of personnel, and uneven burden-sharing between them²⁵⁶, to complaints about the discrepancy between the level of hyperactivity in this domain since 2016 (exemplified by an ‘alphabet soup’ of CSDP, PESCO, EDF, CARD, CDP, MPCC, NIPs, EPF, etc.) and the continuing absence of any tangible shift in the EU’s capability base or readiness for deployment²⁵⁷.

Whilst these concerns are not voiced in a direct link to CBRN threats, it is clear that these tensions and shortfalls also directly affect the strategic, planning and operational capacities of the EU and its CSDP to respond to CBRN threats.

After several years of uncertainty about the outcome of Brexit and about US strategic objectives and its readiness to render support to the EU and to NATO, the experience of the COVID-19 pandemic has increased the demands for more strategic autonomy of the EU.

The direction for the EU to go, it has been argued, is ‘onwards and upwards’. For CBRN preparedness, that must finally translate into actual cooperation, coordination and harmonisation, not only at the level of policy but also in operational terms in the field.

5.2.4 Collaboration with NATO

The North Atlantic Treaty Organisation (NATO/Alliance) primarily deals with CBRN threats in the context of collective defence, which means that it focuses on the defence against the use of weaponised CBRN materials. Military cooperation between the EU and NATO in the field of CBRN involves primarily the Combined Joint CBRN Defence Task Force (CJ-CBRND-TF). The CJ-CBRND-TF is maintained to be prepared to prevent, protect and recover from WMD attacks or CBRN events. It consists of the CBRN Joint Assessment Team (CBRN-JAT) and the CBRN Defence Battalion and is situated under the strategic command of the Supreme Allied Commander Europe (SACEUR)²⁵⁸. The Battalion is a high readiness, multi-national NATO body specifically trained and equipped to operate in armed conflicts and crises, deal with attacks against NATO populations, territory or forces and to carry out missions in support of civilian authorities²⁵⁹. The Battalion was further created to provide NATO missions and deployed NATO joint forces with a credible NBC capability. This is to ensure the Alliance’s freedom of action in an NBC environment. The main activities of the Battalion are NBC reconnaissance, identification of substances and decontamination operations, biological detection and monitoring operations, as well as NBC assessment and advice to NATO commanders. There is little focus on dealing with other aspects of CBRN threats within the Alliance than the defence against the use of CBRN weapons (of mass destruction), mainly in situations of armed conflict. The assets of the battalion include Deployable CBRN Analytical Laboratory, a Multirole Exploitation and Reconnaissance Team, and an Aerial Radiological Survey capability.

In 2016 and 2017, the NATO and EU Councils, in a parallel process, endorsed a total of 74 common proposals designed to further consolidate their mutually reinforcing strategic partnership to the benefit of

²⁵⁶ T. Smit, “Towards a more capable European Union Civil CSDP” SIPRI Policy Brief, 2019.

²⁵⁷ D. Fiott (ed.) “The CSDP in 2020 – The EU’s legacy and ambition in security and defence” EU Institute for Strategic Studies (ISS), 2020.

²⁵⁸ NATO, [Combined Joint Chemical, Biological, Radiological and Nuclear Defence Task Force, 2020](#).

²⁵⁹ V. Edelmans and U. Kurt and P. Merritt, ‘Civil-military preparedness against CBRN threats in Europe – current threats and responses’, FINABEL European Army Interoperability Center - Food for thought, 2020.

all NATO Allies and EU Member States. The most recent progress report²⁶⁰ noted that the cooperation between NATO and the EU in CBRN issues continued, including through staff talks addressing the role of CBRN defence and resilience capacities in the context of COVID-19. NATO's Joint CBRN Defence Centre of Excellence (JCBRND CoE) continued to offer trainings, modelling and CBRN Reachback analysis, i.e. access to remote CBRN expert sources and information, and support to the EU's CBRN Centres of Excellence Initiative²⁶¹. The JCBRND CoE is also a consortium partner of the HORIZON 2020 project for the European Network of CBRN Training Centres (eNOTICE). Furthermore, potential new areas of cooperation identified in the report included an engagement on CBRN issues with the Republic of Moldova, Tunisia and Jordan.

A recent example of successful cooperation is the collaboration of the NATO JCBRN Defence CoE in the aforementioned Horizon 2020 project eNOTICE. This new project links individual training centres and first responder organisations with existing professional networks such as firefighters, law enforcement agencies and others. It is expected to make a valuable contribution to EU-NATO as well as civilian-military cooperation in the domain of CBRN threat preparedness. In response to the Salisbury attack on 22 March 2018, the European Council agreed that the EU must strengthen its resilience to CBRN-related risks through closer cooperation both between the EU and its member states and with NATO²⁶². This reflects a broader need for more EU-NATO coordination of activities and multilateral initiatives, exchanges of sensitive intelligence, preparation of joint reports and, especially, joint EU-NATO exercises covering hybrid-threat scenarios²⁶³. In the same vein, it was recommended in a workshop report on EU preparedness against CBRN weapons to clarify the scope of existing operational and cooperation arrangements to prevent competing initiatives between the EU and NATO²⁶⁴.

5.2.5 Law enforcement

The EU's ISF instrument aims at enhancing EU protections against terrorist threats and includes as a priority measures to ensure protection against CBRN threats. An example for ongoing activities is the MASC-CBRN project developing a Methodology for Assessing States' Capacity for Countering the Hostile Misuse of Chemical, Biological, Radiological or Nuclear (CBRN) Materials and Knowledge²⁶⁵. The project is funded by the EU's 'Internal Security Fund – Police'. It pays specific attention to emerging threats such as advanced technologies and the development of an integrated Directory of the CBRN Risk Spectrum with mapping of the science and technology landscape, country surveys, comparative analysis, and has prepared an Integrated directory on the CBRN risk spectrum.

Europol, the EU law enforcement agency, conducts monitoring of incidents and planning, issues annual EU Terrorism Situation and Trend Reports (TE-SAT) which includes reference to any terrorist incidents involving CBRN materials reported by EU Member States, and supports investigations by EU Member States. The Europol Consolidated Annual Activity Report 2019 (CAAR 2019) observed that Europol's CBRN-E team priorities in 2019 were mainly focused on supporting EU Member States' investigations, strategically and with on-the-spot support, with particular emphasis on the online illicit sale of chemicals and precursors and the use of explosive precursors to make improvised explosive devices (IED). The team also put emphasis on monitoring online jihadist propaganda messages and tutorials on how to perpetrate CBRN or explosives attacks. Cooperation with the French Alternative Energies and Atomic Energy

²⁶⁰ Council of the European Union "Sixth progress report on the implementation of the common set of proposals endorsed by EU and NATO Councils on 6 December 2016 and 5 December 2018" Item Note 9122/21, 2021.

²⁶¹ Written contribution WC02. As explained elsewhere in this report, this, however, is not an EU Centre of Excellence – something that would yet to have been created – but an initiative directed towards developing capacity and strengthening a responsible CBRN culture in partner regions and countries in the EU neighbourhood and globally).

²⁶² European Council meeting (22 March 2018) – [Conclusions](#), 2018.

²⁶³ E. Bajarūnas, "Addressing Hybrid Threats: Priorities for the EU in 2020 and Beyond", *European View* vol. 19 (1) 62-70, 2020.

²⁶⁴ European Parliament, '[Workshop report: EU preparedness against CBRN weapons](#)', 2019, p.20.

²⁶⁵ MASC-CBRN [Briefing Paper 1](#).

Commission (CEA), the European Centre for Disease Control (ECDC) and the IAEA were intense in terms of training activities. Additionally, the team continued to update and promote the use of tools like the European Explosive Ordnance Disposal Network (EEODN, 639 users) and the European Union Bomb Data System (EBDS, 12 users) databases²⁶⁶.

Eurojust, the EU Agency for criminal justice cooperation, supports, amongst others, criminal and terrorism investigations, including with respect to CBRNE threats and incidents. In 2017, its Counter-terrorism team published an overview of EU and international legislation applicable to CBRNE substances and explosives²⁶⁷. This handbook provides EU practitioners, in particular prosecutors and police authorities, with an overview of EU and international legislation applicable to CBRNE materials and with a description of supranational entities, systems and databases active in the field of CBRNE in support of investigations and prosecutions of transnational crimes involving the use of such materials. Although prepared with a particular view on criminal and terrorism investigations, the handbook takes a broader view consistent with an all-hazards approach, and its compilation of legal instruments includes in addition to arms control and counterterrorism treaties and protocols also instruments dealing with accidental releases, environmental protection issues, waste management regulations, regulations related to the transportation of dangerous goods.

In its latest annual report²⁶⁸, Eurojust reported that a total of 222 new and ongoing terrorism investigation cases were supported during 2019, though no reference was made to cases involving CBRN materials or incidents. In September 2019, the Judicial Counter-terrorism Register (CTR) was established; it operates on a 24-hour basis, centralises key judicial information to establish links in proceedings against suspects of terrorist offences, and provides proactive support to national judicial authorities. This information enables prosecutors to coordinate more actively and to identify the suspects or networks. Also, work on the collection of battlefield evidence related to terrorism and/or war crimes is being pursued. No specific data were available on CBRN related work, but media reports suggest that several EU Member States are preparing prosecutions related to CW uses in Syria, including by ISIS. Eurojust also cooperates with the UN Commission of Inquiry into Syria and the International, Impartial and Independent Mechanism (IIIM) to assist in investigating and prosecuting persons responsible for the most serious crimes under International Law committed in the Syrian Arab Republic since March 2011 (IIIM). Both of these mechanisms are investigating serious human rights violations in the Syrian conflict, including the use of military and improvised chemical weapons.

5.2.6 Common Foreign and Security Policy (CFSP)

A complementary policy guiding EU efforts to strengthen CBRN resilience and to mitigate threats emanating from around its external borders and globally is the EU's CFSP. The CFSP aims at preserving peace and strengthening international security in accordance with the principles of the United Nations and its finances, among other things, civilian CFSP missions, EU Special Representatives, stabilisation actions, as well as multilateral and bilateral non-proliferation and disarmament projects.

Relationship with the United States

A central part of preparing an effective response to CBRN threats is to ensure close coordination with the EU's strategic partners, particularly the United States. In the past, collaborations and coordinated actions have been successful in, amongst others, such areas as enhancing border controls in partner countries, strengthening export controls of dual-use goods globally, the removal and destruction of the declared chemical weapons from Syria (albeit the completeness of Syria's chemical weapons declaration to the

²⁶⁶ EUROPOL 2019 Consolidated Annual Activity report (Europol Public Information), 2020.

²⁶⁷ Eurojust CBRN-E Handbook, Version VI.

²⁶⁸ Annual Report Eurojust for 2019.

OPCW is highly in doubt and chemical weapons have been used in this conflict on multiple occasions since 2014), the removal of CW precursor chemicals from Libya for destruction in Germany, and strengthening biosecurity – to mention just a few. The proposed new EU-US agenda for global change²⁶⁹, the new administration in Washington, and the EU's aspiration to make Europe stronger as a global actor²⁷⁰ create new opportunities to develop a **new transatlantic agenda for global cooperation**, including with respect to addressing threats from hybrid and militant threats, violent extremism and global terrorism, and the proliferation of weapons of mass destruction. The guiding principles of this new transatlantic agenda – stronger multilateralism and institutions, pursuance of common interests and leverage of collective strength, respect for common values of fairness, openness and competition – will help to revitalise this close partnership with the US.

EU CBRN Centres of Excellence

A stronger partnership with third countries is important to promote a global culture of CBRN safety and security and, in doing so, to contribute to CBRN threat resilience in Europe. The global EU CBRN Centres of Excellence Initiative (CBRN CoE) has become an important and effective tool of the EU to engage with partner countries and regions and promote the sharing and adoption of best practices in CBRN risk mitigation. This initiative was launched in 2010, signalling a move from ad hoc support measures to build capacity in certain countries and areas.

Today, the initiative reaches out to 62 partner countries in 8 regions. It was initially funded from the Instrument for Stability (IfS) and subsequently from the Instrument contributing to Stability and Peace (IcSP). Under the latter, it is the largest multi-country funded project²⁷¹. In the future, the CBRN CoE initiative will be funded through the Neighbourhood, Development and International Cooperation Instrument (NDICI, a.k.a 'Global Europe')²⁷². Following recent changes, it is now led by the European Commission's Service for Foreign Policy Instruments (FPI) in close coordination with the EEAS.

The CBRN CoE initiative has an active interface with the **European Commission's export control partner to partner (P2P) programme**. This programme promotes the adoption and implementation of export control policies and measures by partner countries in alignment with EU policies and the requirements of the ATT. This programme is managed by the JRC and overlaps with the objectives of the CBRN CoE initiative in the area of export controls of dual-use goods, including CBRN materials, equipment and technologies and know-how. Furthermore, the programme uses the CBRN CoE framework as a platform for engagements and project delivery.

The principles underlying the CBRN CoE initiative can be summed up as follows²⁷³:

- **Bottom-up approach** building on the formation of national CBRN teams in partner countries, which also includes conducting national needs assessments and the adoption of national CBRN action plans by the currently 62 partner countries and 2 candidate countries;

²⁶⁹ High Representative of the Union for Foreign Affairs and Security Policy, Joint Communication to the European Parliament, the European Council and the Council "A new EU-US agenda for global change" JOIN(2020) 22 final, 2020).

²⁷⁰ General Objective 5 of the Von der Leyen Commission; European Commission, "A stronger Europe in the world" [webpage](#).

²⁷¹ European Parliament, 'Peace and Security in 2019: Outlook of EU action and outlook for the future', 2019, p.60.

²⁷² The European Parliament and the Council reached political agreement, in March 2021, on the Neighbourhood, Development and International Cooperation Instrument (NDICI) – 'Global Europe' for the next MFF period (2021-2027). This instrument will support the EU's external action with an overall budget of €79.5 billion in current prices, of which €6.36 billion have been earmarked for thematic programmes in the areas of Human Rights and Democracy; Civil Society Organisations; Peace, Stability and Conflict Prevention; and Global Challenges), see [website](#).

²⁷³ European Union [webpage](#) on CBRN-COE, visited on 4 June 2021.

- **Regional approach** involving the creation of regional platforms in the form of 8 Regional Secretariats (as of June 2021) to facilitate regional cooperation and interaction of the partner countries with the EU in the field of CBRN risk mitigation, including the delivery of relevant CBRN projects;
- **Systematic, all-hazards approach** addressing all CBRN risk dimensions, from natural risks to accidental releases and malevolent uses, including by terrorist actors.

Two audits by the **European Court of Auditors** in 2014 and 2018 respectively have confirmed the utility of the initiative to facilitate capacity building in partner countries in the area of CBRN risk mitigation, and to promote regional cooperation and cooperation between the participating partner countries and the EU in this field. EU Member States were able to transfer expertise and knowledge to partner countries and to promote the global adoption of a culture of safety and cooperation and of responsibility, prevention and preparedness with regard to mitigating CBRN risks. As a result of the CoE initiative and the support rendered by EU bodies (EEAS, DG DEVCO, JRC), experts from EU Member States, and UNICRI, 40 partner countries have conducted national CBRN needs assessments, 34 partner countries adopted National CBRN Action Plans aligned with the requirements of UN Security Council Resolution 1540, and 88 regional and interregional projects, including training and equipment installations have been funded by the EU and delivered by EU experts to the partner countries. As such, the Court of Auditors further noted that the CBRN CoE fill a gap in the European security strategy against the proliferation of WMD due to their 'comprehensive and demand-driven approach and the distinct focus on regional cooperation [which provides] a long-term response to priorities'²⁷⁴.

The Court of Auditors' 2014 report also identified several issues that need to be addressed and issued a set of recommendations²⁷⁵. The subsequent 2018 special report of the Court of Auditors²⁷⁶ confirmed that the CBRN CoE initiative has contributed to mitigating threats and that improvements were made to the cooperation between decision-makers and implementing bodies. It further noted that most of the recommendations issued in the 2014 special report had been implemented²⁷⁷. However, it also again highlighted deficiencies with regard to, amongst others, the role of EU delegations and the speed of project implementation, the application of an adequate risk assessment approach for project selection as well as needs assessments of partner countries, and a lack of guidance to partner countries with regard to how CBRN risks should be identified and prioritised. Overall, the 2018 report issued another 6 recommendations.

²⁷⁴ European Court of Auditors, [Special Report No.17](#), 2014, p.5.

²⁷⁵ European Court of Auditors, [Special Report No.17](#), 2014, p.22.

²⁷⁶ European Court of Auditors, [Special Report No. 14](#), 2018.

²⁷⁷ Out of six recommendations, three were fully implemented and two partially. One was not implemented. European Court of Auditors, [Special Report No. 14](#), 2018, Annex II.

Table 0.4 Recommendations on the CBRN CoE from the Court of Auditors' 2018 special report²⁷⁸

No.	Recommendation	Implementation
1	Prioritise activities on the basis of a systemic risk assessment	Through National Action Plans (NAP), partner countries are enabled to define their priority objectives in the field of CBRN Risk Mitigation. They can share them to build joint projects and formulate an integrated regional approach. The identification and documentation of areas requiring Chemical, Biological, Radiological and Nuclear (CBRN) Risk Mitigation takes place through a Needs Assessment Questionnaire (NAQ). Eventual threat mitigation is based on a voluntary request from any Partner Country.
2	Strengthen the Initiative's regional dimension	Since 2018 a number of field exercises have been carried out with a regional dimension. These developments showcases the desire to have an increased regional impact .
3	Further strengthen the EU delegations' role in the Initiative	There is no record of an actually strengthened position of the EU delegations.
4	Identify potential synergies and other available funding sources	The main funding for the EU CBRN Risk Mitigation Centres of Excellence is coming from the Neighbourhood, Development and International Cooperation Instrument (NDICI), the EU's main international cooperation instrument supporting security initiatives and peace-building activities in Partner Countries. The funding of the CBRN CoE through the NDICI is a recent development. No records were found on the efforts of the CBRN CoE to find new sources of funding beyond the NDICI, or funding synergies. As information on funding can be considered as sensitive, the absence of this kind of public information does not mean these efforts are not being made.
5	Increase accountability and visibility of activities and results through improved monitoring and evaluation	The visibility of the CBRN CoE has been improved by means of a coherent European Commission-based website. There is however no trace of an increased accountability through over monitoring and evaluation.
6	Overhaul the web-based portal to allow easy access to all the information concerning the Initiative's activities	The CBRN CoE's Regional Secretariats make available relevant expertise, including best practices, legal issues, scientific and technical support and practical training on CBRN risk and security issues through the CBRN CoE Centres of Excellence Private Portal , which is a web-based information portal participating countries. Furthermore the CBRN CoE initiative manages a public website with information on all their projects.

Further, interviews with European Commission officials²⁷⁹ have confirmed that the CBRN CoE initiative is highly valued by the partner countries and perceived as a useful framework for engaging in cooperation and exchanges with the EU on highly sensitive issues. It is also well perceived as a platform for the delivery of projects that increasingly meet the expectations and requirements of the partner countries. As such, it is considered that the value of the CBRN CoE goes beyond the transferring of knowledge and best practices through targeted projects (88 such projects have so far been funded, 31 of which are still in progress), but

²⁷⁸ European Court of Auditors, [Special Report No. 14](#), 2018, p.33-36.

²⁷⁹ INTV04, INTV03, INTV02.

that the **creation of a trusted network of experts** who deal with CBRN risks in the participating countries, within the regions, across regions, and between partner countries and the EU may be the most important aspect. This building of trust and networks has helped to develop a broader global acceptance of the need to implement measures such as those required under UNSC Resolution 1540 or those needed to domesticate and nationally implement the relevant arms control and non-proliferation treaties. It has also contributed to spreading a culture of responsibility regarding CBRN risk management in government institutions, academia, and industry, including preventing access to CBRN materials, equipment, technologies, and know-how by non-state actors.

The level of visibility of the CBRN CoE within the EU is much smaller than its high visibility outside the EU would suggest²⁸⁰. While the CBRN CoE initiative is internally primarily considered as a coordination programme on the outside of the EU, there is potential for the initiative to become an EU flagship programme, which could create more geopolitical leverage for the EU to cooperate with other countries and regions and to act on a global basis. However, for that to become a reality, the CBRN CoE initiative will require strong leadership, the development of a long-term strategy that is based on clear risk assessments and priorities, shared and supported across the European Commission and the EEAS, and a long-term political and financial commitment by the EU Member States. The CBRN CoE initiative already received significant financial and temporal investments, and it is today well recognised by partners and by the participating countries as a significant contribution of the EU to global CBRN safety and security. It remains to be seen to what extent the recent transfer of the lead role for the CBRN CoE Initiative from DG DEVCO to FPI and the experiences of the COVID-19 crisis will enhance the level of awareness and political attention in the EU in terms of the above-discussed aspects on leadership and other elements required to take the CBRN CoE initiative forward.

The CBRN CoE Initiative has been met with difficulties when it comes to integrating harmonised standards, criteria and procedures into the operational structures of the participating countries. Embedding results into the national response systems and into regional response mechanisms remains a challenge. This may reflect a lack of leadership and strategy on the part of the EU, but it also reflects the fact that the EU itself lacks such a CBRN Centre of Excellence, for its own purposes as much as a point of reference and a partner for the CoEs set up under the initiative. As will be discussed in Chapter 7 on the recommendations of this study, the establishment of such an EU CBRN CoE would be a major step towards better harmonisation and coordination within the EU, and a means of exchange on technical issues in the CBRN safety and security domain with the outside.

Actions under the Non-proliferation and Disarmament Action Area

Complementing the actions implemented under the CBRN CoE Initiative are actions agreed by EU Member States in the Council, in the form of **CFSP Council Decisions** taken in the Non-proliferation and Disarmament (NPD) action area of the CFSP. Actions in the area of non-proliferation and disarmament of weapons of mass destruction continue to provide critical funding and support to a number of International Organisations and the United Nations, aiming amongst others at promoting global adherence to the relevant international treaties (universalisation), improving national implementation of the requirements undertaken under these instruments by all countries, strengthening the institutional mechanisms and maintaining or expanding the technical capabilities of these international agencies with respect to verification of compliance, the timely and robust investigation of breaches of treaty obligations, the fostering of international cooperation and assistance in their respective fields of activity. CFSP decisions have also helped implement certain ad-hoc measures in the area of disarmament and non-proliferation of weapons of mass destruction and related materials and equipment, as well as the establishment of a UN

²⁸⁰ INTV03.

OPCW Joint Investigation Mission to identify those responsible for chemical weapons attacks in the Syrian conflict. For more details, see 7.1.8 below.

Finally, **sanctions** are among the tools the EU has been using to deter and respond to breaches of international rules against certain State and corporate actors as well as certain individuals that have been found to have committed or supported acts in breach of international norms that ban the proliferation and use of weapons of mass destruction. For example, in respect to sanctions issued against violations involving the use of chemical weapons, on 12 October 2020, the Council decided²⁸¹ to extend the sanctions regime against the proliferation and use of chemical weapons by one year, allowing the EU to impose restrictive measures on persons and entities involved in the development and use of chemical weapons. On 14 October 2020, the Council adopted restrictive measures²⁸² against six individuals and one entity involved in the assassination attempt on Alexei Navalny, who was poisoned with a toxic nerve agent of the 'Novichok' group on 20 August 2020 in Russia.

In summary, the CFSP provides an essential framework for the EU to further enhance and cement its role as a respected and effective global actor that stands for a norm-based international system based on effective multilateralism. Its tools have been deployed over the years in crisis management, stabilisation missions, and in addressing long-term global challenges such as the climate crisis, the prevention of conflict, as well as post-conflict stabilisation, disarmament and non-proliferation, and more. CBRN risk mitigation has been an important part of these endeavours, and the EU – in close coordination with its partners - has implemented as well as funded a myriad of projects to assist partner countries on a global basis in building capacity and developing a culture of responsibility to deter and prevent CBRN proliferation. These projects and the creation of networks such as the CBRN CoE Initiative have been strategic investments into reliable and trusted partnerships, as well as increasingly more robust capacities around the EU and globally that directly benefit the safety and security of the EU and its citizens. The CBRN CoE Initiative, in particular, has great potential in furthering these partnerships; it needs to be further enhanced, with strong leadership, increased technical competence and reach-back into the competence networks within the EU, and stable funding.

5.2.7 Union Civil Protection Mechanism (UCPM)

The UCPM was created in 2001 and aims at strengthening cooperation in the field of civil protection between the EU Member States and the six other countries participating in the mechanism. When the response capacity of a country in Europe or elsewhere is overwhelmed by the scale of a disaster, it can request assistance through the UCPM. The European Commission plays a key role in coordinating disaster response across the world and contributes at least 75% of the transport and/or operational costs of deployment missions. Civil protection assistance can take the form of in-kind assistance, deployment of specially-equipped teams, or assessment and coordination by experts sent to the field. A well-coordinated response at European level is necessary to avoid duplication of relief efforts and ensure that assistance meets the real needs of the affected region. The UCPM enables a more rapid and effective response to emergencies by coordinating the delivery of civil protection teams and assets to the affected country and population. Via the UCPM, the European Commission can focus efforts on areas where a joint European approach is more effective as opposed to separate national actions. Each year, the European Commission publishes calls for proposals to fund activities aimed at promoting and encouraging cooperation in prevention, preparedness and awareness-raising activities in civil protection and marine pollution. The UCPM also has a role in responding to CBRN incidents, including natural outbreaks such as the COVID-19 pandemic. In this regard, the UCPM can be considered to be a useful mechanism to address CBRN events,

²⁸¹ Council of the European Union, Decision (CFSP) [2020/1466](#) of 12 October 2020 amending Decision (CFSP) 2018/1544 concerning restrictive measures against the proliferation and use of chemical weapons Decision CFSP/2020/1466, 2020.

²⁸² Council of the European Union, Decision (CFSP) [2020/1482](#) of 14 October 2020 amending Decision (CFSP) 2018/1544 concerning restrictive measures against the proliferation and use of chemical weapons, 2020.

considering the low probability of CBRN occurrence at national level, their frequent cross-border elements and the costly response capacities that are required in countering CBRN events, which may thus not be maintained at sufficient level in every single EU Member State.

Already before the COVID-19 pandemic, an exercise organised by the Romanian Presidency of the Council of the European Union and the EU-NATO European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE) organised a two-day joint workshop on EU-NATO cooperation in civil protection. The workshop assessed EU and NATO requirements and methods for civil protection in a table top exercise simulating a deliberate pathogen release in a hybrid incident context. This exercise exposed deficiencies in complex crisis situations with regard to available stockpiles of respiratory equipment and deficiencies in the support from other EU Member States²⁸³ – similar problems emerged early in the COVID-19 pandemic.

The development of stronger EU civil protection response (rescEU)²⁸⁴ capacities in the field in CBRN was already recognised as key to strengthening CBRN resilience in the EU by the 2020 EU Security Union Strategy. In 2021, during the pandemic, the European Parliament considered a series of amendments to the legislative act on the Union Civil Protection Mechanism²⁸⁵, which observed that the COVID-19 pandemic had demonstrated that the EU and its Member States need to be better prepared to respond to large-scale emergencies that impact several EU Member States simultaneously, and that the existing legal framework on health and civil protection should be reinforced. The document highlighted amongst many other issues the need for a comprehensive risk assessment to underpin prevention and preparedness, taking into account a multi-hazard approach, and a need to strengthen the role of the Emergency Response Coordination Centre (ERCC), supported with regard to scientific expertise by the JRC. It also pointed to the lack of adequate transport and logistical resources during the COVID-19 pandemic, which ought to be defined henceforth as rescEU capacities based on inter alia any existing scenario-building, and taking into account identified and emerging risks and overall capacities and gaps at EU level, in particular in the areas of aerial forest-firefighting, chemical, biological, radiological and nuclear incidents, emergency medical response, as well as transport and logistics.

In May 2021, the European Parliament and the Council adopted the new regulation to strengthen the EU Civil Protection Mechanism²⁸⁶, which aims at improving the EU and Member States to better prepare for natural and human-made disasters and to respond faster when they strike, including in cases that affect a majority of Member States simultaneously, such as a pandemic. It will allow the European Commission, in cases of urgency, to directly procure certain additional rescEU capacities. These and the rescEU capacities hosted by Member States will be fully financed from the EU budget and a total of €1,263 million in funds for the 2021-2027 period.

5.2.8 International Collaborations: UN and relevant associated International Organisations

The relationship of the EU with relevant international organisations working in the areas of arms control, non-proliferation, counterterrorism, human rights and humanitarian assistance is an important aspect of the EU's CFSP. The EU has been a major donor and actor in collaboration with UN and other organisations active in these fields, including certain non-governmental organisations (for example, in the Small Arms Light Weapons (SALW) risk reduction area, or the implementation of the Anti-personnel Land Mine Convention (Ottawa Convention).

²⁸³ Hybrid CoE, Medical-based scenario highlights significance of EU Civil Protection Mechanism, 2019.

²⁸⁴ [COM\(2020\)605](#).

²⁸⁵ Regulation of the European Parliament and the European Council amending Decisions No 13131/2013/EU on a Union Civil Protection Mechanism, PE-CONS 6/21, 2021.

²⁸⁶ European Parliament, Legislative Observatory, Union Civil Protection Mechanism, [2020/0097\(COD\)](#), 2020.

As to the UN, it deals with a specific aspect of the CBRN threat by first and foremost addressing the use of CBRN materials for purposes of mass destruction by terrorists through its Office of Counter-Terrorism (UNOCT). The main executive body of the UNOCT is the UN Counter-Terrorism Centre (UNCCT), which runs the main UN programme on chemical, biological, radiological and nuclear terrorism²⁸⁷. Additionally, the Terrorism Prevention Branch of the United Nations Office on Drugs and Crime (UNODC/TPB) 'is assisting States with the ratification and implementation of the 19 international conventions and protocols related to terrorism, including the seven legal instruments out of the 19 that deal, to varying degrees, with chemical, biological, radiological and/or nuclear (CBRN) terrorism'²⁸⁸.

With regard to CBRN risk mitigation, Joint Actions and actions financed under Council Decisions in the Non-proliferation and Disarmament area have made significant contributions to strengthening universal adherence to the relevant international treaties and regimes/mechanisms, to enhancing their national implementation and enforcement by countries adhering to them, by strengthening the international mechanisms and institutions and by developing and applying tools in such areas as verification, investigation of violations of prohibitions (such as in the case of chemical weapons uses in the Syrian conflict), strengthening resilience against threats associated with CBRN weapons and materials, and promoting regional and international cooperation in these areas as well as in the transparent and responsible uses of CBRN materials, equipment and technologies for peaceful purposes. The funding provided addresses CBRN threats emanating from both State and non-state actors and ranges from support for awareness-raising and concepts development to the development of institutional and technical capabilities as well as the funding of ad hoc measures such as de-proliferation operations and investigations. The table in Annex V provides an overview of the relevant actions supported by Council Decisions since 2014.

Worth mentioning, too, are the collaborations of European institutions and agencies that have mandates with respect to CBRN risk mitigation with partner organisations in other countries and/or internationally. An example is the working relationship between Europol and INTERPOL, including with regard to the interfacing of response systems in the law enforcement and public health domains. Similar relationships exist in the public health sector, in the field of civil defence and humanitarian assistance, and in other areas.

5.2.9 Relationships with the Research Community and the Private Sector

Preparedness for CBRN incidents goes beyond policies and cooperation mechanisms at the national, supranational and intra-EU level. Additional relevant aspects in this area include the relationship with the industry and the link between science, innovation, practitioners and policies, as well as procurement policies and mechanisms fostering the development and implementation of innovative technological solutions.

Project EDEN was set up in 2013 under EU Research Framework Programme 7, aiming at covering the entire cycle of CBRNE from prevention to preparedness and response and ensuring resilience capacity in the EU. It was set up as a collaborative project involving 36 partners from across 25 countries. The project has set up platforms for SMEs across Europe working in the CBRNE domain, a supplier platform, and an end-user

²⁸⁷ The programme has developed 7 (pilot) projects so far: 1) Enhancing national capabilities to prevent and respond to chemical and biological terrorist attacks in Iraq; 2) Enhancing capabilities to prepare for and respond to CBRN terrorist attack in Jordan; 3) Promoting universalization and effective implementation of the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT); 4) Enhancing knowledge about advances in science and technology to combat WMD terrorism; 5) Addressing the Terrorism-Arms-Crime Nexus: Preventing and Combatting the Illicit Trafficking of Small-Arms and Light Weapons (SALW) and their Illicit Supply to Terrorist - in Central Asia; 6) Ensuring Effective Inter-Agency Interoperability and Coordinated Communication in case of Chemical and/or Biological Attacks - Phase III (Implementation); 7) Developing Technical guidelines to facilitate the implementation of Security Council [resolution 2370 \(2017\)](#) and subsequent relevant resolutions, preventing terrorists from acquiring small arms and light weapons (SALW), improvised explosive device (IED) components and unmanned aircraft systems (UAS) and components.

²⁸⁸ UNODC, [Tackling Chemical, Biological, Radiological and Nuclear Terrorism](#).

platform. The project was able to pool the activities of companies, enabling them to collaborate on innovative projects in such areas as defence against drones, an ultra-clean airlock for future missions to Mars, which include severe biological cleanliness constraints, new surface treatments for use in CBRN defence, a compact gyro-stabilised turret that enables drones and other platforms to conduct reconnaissance and identification missions day and night, several projects with companies working together towards equipment integration, highly effective and sensitive site surveillance systems, equipment for law enforcement such as accessories for FlashBall® equipment and other products for law enforcement and protection. The collaborations started under the EDEN project continue and expand today.

Capitalising on the experience from the EDEN project, other CBRN relevant projects, and in the CBRN market and supply chain, **ENCIRCLE**²⁸⁹ was established as an innovative approach to promoting innovation and business development to fill market gaps in the CBRN domain. The project aims at creating an open and neutral EU CBRN cluster, providing a sustainable and flexible vision and roadmap for the development of the European CBRN market and innovations, providing integration with platforms (systems, tools, services, products) by proposing standardised interfaces and future EU standards to integrate CBRN technologies and innovations, supporting CBRN safety, security and defence commercial and market services, and improving and facilitating European CBRN defence technologies dissemination and exploitation.

These efforts are complemented by initiatives under the EU **CoU on secure, safe and resilient societies**, an initiative of DG HOME to improve information transfer of research outputs and facilitate their usability by different categories of stakeholders. The CoU provides policy updates and facilitates information sharing and interactive discussions on Horizon 2020 projects and has conducted an extensive mapping of the policy background regarding CBRNE actions, the EU's funding instruments with regard to research, development and capacity building, and a detailed mapping of EU policies with respect to research in the light of societal challenges in security, safety and resilience²⁹⁰.

However, while these projects may have produced many innovative technologies and increased visibility for them, the developed technologies and innovations are unable to add to EU CBRN preparedness in any meaningful way if they 'remain on the shelf', i.e. are not ultimately brought to market or otherwise exploited in any tangible way. This is a challenge not just for the area of CBRN preparedness and response, but is also faced by many of the Seventh Framework Programme (FP7) and H2020 research outputs and the European defence market at large. It is also the reason why the above-mentioned CoU initiative was first launched in 2014, i.e. to bridge the research-policy-practice/market gap. Hence, the question remains to what extent technologies, products, etc. have been developed through the above-mentioned projects, exploited and/or brought to market.

5.2.10 Engagement with Populations / Civil Society

Actions in the area of CBRN have often been driven by State-centric considerations (State security considerations, terrorist and organised crime (OC) threats), less so by threats affecting populations. However, resilience is only achievable if the population understands and supports the measures taken to minimise these threats and respond to incidents if they happen. These measures required populations to willingly participate in measures to mitigate such threats and their consequences. This calls for a strategic approach to education, honest and effective risk communication, advanced communications planning and execution in accordance with accepted principles.

²⁸⁹ ENCIRCLE, [webpage](#).

²⁹⁰ DG HOME: A Community of Users on Secure, safe and resilient societies (CoU) – mapping EU policies and FP7 research for enhancing partnerships in H2020.

It also requires to position CBRN threats in a broader context of evolving risks, including global warming and the climate crisis, threats to safe access to drinking water, food and medical care. The new EU Security Union Strategy recognised that awareness of security issues and acquiring the skills to deal with potential threats are essential to build a more resilient society with better-prepared enterprises, administrations and individuals. But the COVID-19 pandemic (involving disinformation campaigns as well as conspiracy theories regarding the efficacy or not of certain treatments, on alleged risks associated with certain types of vaccines, and on the origin of the virus), as well as disinformation campaigns after the poisoning cases in Salisbury (Skrpals) and Russia (Navalny), have also shown the need for developing effective strategies and tools to counter disinformation campaigns that have a direct impact on the degree of harm resulting from a given situation.

This also relates to hybrid threats, and specific risks were identified in a Joint Communication by the High Representative. Actions taken in response to such threats include targeted communication campaigns, providing factual information, working together with major online platforms to tackle disinformation, increasing public awareness, and monitoring the platforms' action²⁹¹. To illustrate the dimension of this rapidly expanding threat dimension, during the first half of 2020, the EUvsDisinfo public database of disinformation cases has added 1963 new pro-Kremlin related disinformation cases, of which close to one-third have been related to the COVID-19 infodemic²⁹².

In all these respects, the European Parliament has the authority and capacity to frame and help develop further EU policies and actions. It is in a unique position to make cross-sectoral and multidisciplinary links to ensure a more holistic, all-hazards approach that positions prevention of and response to CBRN threats within a broader context of enhancing societal resilience. Such an approach can also result in broader public understanding and awareness of the multiple risks emanating from hazardous materials, be they associated with hostile acts of States or non-state actors or the result of accidents or natural causes, and of measures necessary to mitigate these risks.

5.2.11 Other EU tools

EU INTCEN is an intelligence body of the EEAS and provides strategic intelligence and threat assessment. It plays a critical role in increasing EU situational awareness and in supporting EU risk assessment. A future-proof EU counter-terrorism policy, including with regard to CBRN threats, must be based on solid threat assessments, in particular from national security and intelligence services. It depends critically on high-quality input from EU Member States.

Another tool that was developed in recent years is the 'Joint Framework on Countering Hybrid Threats: A European Union Response'²⁹³. This framework recognises, in item 4.3, 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 EU and have major economic and social effects on crucial areas of the EU food chain. Existing EU structures for health security, environmental protection, and food safety can respond to hybrid threats using these methods.' The European Commission has been encouraged under the framework to improve awareness of and resilience

²⁹¹ European Commission, Joint Communication to the European Parliament, the European Council, JOIN 8, Joint Communication, Tackling COVID-19 disinformation - Getting the facts right, 2020.

²⁹² More on European Democracy Plan (2020), Action Plan against Disinformation (2018) and Code of Practice on Disinformation and 2020 assessment thereof – see [COM\(2020\)797](#) final.

²⁹³ European Commission, Joint Communication to the European Parliament and the Council on a Joint Framework on countering hybrid threats: A European Union response. Communication, [JOIN\(2016\)18](#) final, 2016. Communication, [JOIN\(2016\)18](#) final, 2016.

to hybrid threats within existing preparedness and coordination mechanisms, notably the Health Security Committee.

A significant step towards these objectives was the decision to establish the Hybrid Centre of Excellence in April 2017 (see Section 7.1.7 above for more detail). By 2021, it has 28 participating states (EU and NATO) and is engaged in promoting dialogue and consultation among participating countries at the EU–NATO strategic level. It also conducts research and analyses hybrid threats and methods of countering such threats, and it organises exercises²⁹⁴.

5.3 Previously Identified Gaps in the EU's response

Previous reviews, reports and audits have identified a number of gaps in the EU's capacities and mechanisms set up to prevent, detect, respond to and mitigate the consequences of CBRN threats and incidents. Many of them have already been alluded to in the above discussion, and in a number of areas, work is ongoing to improve the situation.

In the context of **counter-terrorism**²⁹⁵, there remain certain gaps in transposing EU legislation into national laws and regulations. There also remain weaknesses with regard to the protection of critical infrastructure, including health care infrastructure and water treatment facilities, that may be targets for terrorist attacks. The EU Security Union Strategy notes that the EU's existing framework for protection and resilience of critical infrastructures has not kept pace with evolving risks and that gaps exist regarding the legal framework and interconnectedness and interdependencies. Both stronger cyber and physical measures of protection for critical infrastructure are needed²⁹⁶.

As to the **UCPM**, a number of capacity gaps in various CBRN-related areas were identified in a 2019 study conducted by the Centre of Strategic and Evaluation Services LLP²⁹⁷. These relate to medical countermeasures, detection and sampling/analysis, search and rescue protective clothing for operations in contaminated areas, the lack of a training module for personal protective equipment and operational support in CBRN environments, capability for decontamination of responders and equipment, maintenance of an adequate capability for medical aerial evacuation of disaster victims, as well as a lack of capacity to transport infectious patients or other patients requiring very specific care as a result of an event. It is worth noting that this study also included CBRN as being directly or indirectly concerned in five of its nine worst credible events to be anticipated²⁹⁸, which adds a level of urgency to addressing these gaps. Further, a 2018 study for the TERR Committee on EU Civil Protection Responding to CBRN Incidents and Attacks analysed, among others, the preparedness of the UCPM against terror attacks involving the use of CBRN materials and agents. It deemed the UCPM to be insufficient to respond to novel offensive tactics and strategies and recommended that 'the UCPM [should ready] itself for such attacks as well as [train] its personnel and representatives or participating countries to cope with the consequences of novel CBRN terrorist attacks'²⁹⁹. It further recommended that dedicated Action Plans should be created for each scenario of chemical agents, rather than limiting preparation for selected agents. Further, to enhance the efficacy of the UCPM, it was recommended that it should be granted limited agency in terms of crisis and

²⁹⁴ E. Bajarūnas, "Addressing Hybrid Threats: Priorities for the EU in 2020 and Beyond", European View vol. 19 (1) 62-70, 2020. For participating countries see Hybrid CoE [webpage](#).

²⁹⁵ COM(2020)795 final.

²⁹⁶ Directive [2016/1148](#) concerning measures for a high common level of security of network and information systems across the Union, OJ L 194, 19.7.2016, 2016; Council Directive [2008/114/EC](#) on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, OJ L 345/75 23.12.2008, 2008.

²⁹⁷ Centre for Strategy and Evaluation Services LLP Otford, Kent (UK), Evaluation Study of Definitions, Gaps and Costs of Response Capacities for the Union Civil Protection Mechanism, D7: Final report, 2019.

²⁹⁸ These are: International medical emergency, chemical release, nuclear, marine pollution and critical infrastructure.

²⁹⁹ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018, p. 4, 19.

emergency management. The baseline for the latter recommendation is that the UCPM was excluded from decision and policy-making processes³⁰⁰. In line with the recommendation to increase the UCPM's readiness to respond to novel and offensive attacks, the European Parliament adopted amendments to a European Commission proposal of Decision No 1313/2013/EU of the European Parliament and of the Council on 31 March 2018, which, among others, called for 'UCPM field of action to be extended to terrorist attacks and chemical, biological, radiological and nuclear threats'³⁰¹. Following inter-institutional discussions, the Council and the European Parliament signed and adopted Decision (EU) 2019/420 on March 2019³⁰². Deviating from the recommendation to grant the UCPM limited agency in terms of crisis and emergency, the European Commission put forward a new proposal on 2 June 2020³⁰³, further amending Decision No 1313/2013/EU, with the aim of reinforcing 'the UCPM and the crisis management system within the Union'³⁰⁴. Among others, the proposal will (i) enable the European Commission to procure directly rescEU functioning as pre-positioned in logistical hubs, and (i) in order to improve planning in prevention and preparedness at EU level, reinforce cross-sectoral and all-hazard approaches to transboundary disaster risk management, based on 'disaster resilience goals' and planning elements at Union level'³⁰⁵.

In the context of threats posed by state actors, **hybrid threats** have become critically important. The actions set out in the Joint Framework on a European Union response to countering hybrid threats, adopted in April 2016, are a further step in the right direction. They focus, inter alia, on enhancing the protection and resilience of critical infrastructures (including transport infrastructure, but also otherwise, e.g. water purification plants) and on protecting public health and food security against a CBRN attack. More, however, might need to be done in the future.

In terms of **legislative needs**, it has been suggested that protecting the safety and security of food supply and public health will need new legislation. In February 2017, there has been an exchange of views between the European Parliament's Environment Committee and the European Commission on food defence, i.e., the protection of food from intentional contamination or adulteration by biological, chemical, physical, or radiological agents. On that occasion, several Members pointed to the risks of bioterrorism for the food supply chain and public health in the EU, urging the European Commission to come up with new legislation. The EU Parliament's position on **food and health safety** was that in the past, it has been attaching particular importance to strengthening chemical, biological, radiological and nuclear security in the EU, with a special focus on the protection of public health, the environment and food safety. In its Resolution of 14 December 2010 on the CBRN Action Plan, Parliament stressed, in particular, that the intentional spreading of communicable diseases or the contamination of food, soil, air and drinking water by CBRN agents could seriously impact animal and human health, food safety and security, and the environment, also in the longer-term³⁰⁶.

In addition to a call for **recovery and decontamination strategies** to be included in the CBRN policy, Parliament pointed to the need to enhance the security of radioactive and nuclear materials and facilities

³⁰⁰ European Parliament, '[EU Civil Protection Responding to CBRN Incidents and Attacks](#)', 2018, p. 27.

³⁰¹ European Parliament, Legislative Train Schedule Area of Justice and Fundamental Rights, Revision of Decision 1313/2013/EU for a fully-fledged European Union Civil Protection Mechanism with own operational capacities [webpage](#), November 2017.

³⁰² European Commission, Decision (EU) [2019/420](#) of the European Parliament and of the Council of 13 March 2019 amending Decision No 1313/2013/EU on a Union Civil Protection Mechanism, OJ L 77/1, 20.3.2019.

³⁰³ European Commission, Decision of the European parliament and of the Council amending decision No 1313/2013/EU on a Union Civil Protection Mechanism, [COM\(2020\)220 final](#).

³⁰⁴ European Parliament, Legislative Train Schedule Area of Justice and Fundamental Rights, Revision of Decision 1313/2013/EU for a fully-fledged European Union Civil Protection Mechanism with own operational capacities [webpage](#), November 2017.

³⁰⁵ European Parliament, Legislative Train Schedule Area of Justice and Fundamental Rights, Revision of Decision 1313/2013/EU for a fully-fledged European Union Civil Protection Mechanism with own operational capacities [webpage](#), November 2017.

³⁰⁶ A. Vălean, Protecting EU's citizens and environment – A new EU legislation is needed for CBRN food and health risks, webpage article, 2018.

and to better protect public transport networks. As far as the implementation of the EU CBRN Action Plan's measures on nuclear security goes, most actions foreseen in the CBRN Action Plan have in the meantime been fully implemented³⁰⁷.

Work continues under the action plan with regard to developing regulatory measures, similar to measures regarding explosive materials, for chemicals that have been identified as of particular concern in a terrorist context. Adopting regulations in this respect would help to address a specific security concern that has been identified based on recent terrorist situations.

With regard to the work of the **EU CBRN Centres of Excellence**, work is continuing, and the shift of responsibility from DG DEVCO to FPI may help to increase further the awareness of and leadership for this well-recognised initiative. The deficiencies identified by the Court of Auditors with regard to strategic direction, priority setting, metrics of evaluating (in particular) impact and sustainability of projects delivered still need to be fully addressed, however. Equally important will it be to maintain the financial backing and human capacity to adequately manage the CBRN CoE network and the project delivery system.

In 2018, a study on EU Member States' Preparedness for CBRN threats offered recommendations on both joint **procurement** and the establishment of medical **stockpiles** in the EU. Shortcomings relating to the JPM and the building of stockpiles were already mentioned in passing in Sections 5.2.1 and 5.2.7. As to the establishment of stockpiles, it was recommended in 2018 that the European Commission should establish EU-funded stockpiles of medical countermeasures to be able to distribute these when needed. The stockpiling should be done following a consultation of EU Member States as to their requirements and should then be procured through the JPM. Until the pandemic, there were little developments on the further stockpiling of medical countermeasures. However, several advances were made at a later stage of the pandemic. In March 2020, the European Commission implemented decision (EU) 2020/414³⁰⁸ on how to create the first-ever stockpiles of medical equipment under rescEU, part of the EU Civil Protection Mechanism³⁰⁹. Towards the end of the pandemic, the rescEU stockpiles were expanded and three new host countries were added to the six already existing host countries³¹⁰. Supplies now include more than 65 million medical masks and 15 million FFP2 and FFP3 masks, more than 280 million pairs of medical gloves, close to 20 million medical gowns and aprons and several thousand oxygen concentrators and ventilators. The JPM is being used to create and extend the rescEU stockpiles, in accordance with earlier recommendations. Looking at the JPM and specific recommendations for it in more detail, it is generally seen as a good tool to enable EU Member States to acquire medical countermeasures to fulfil their obligations under the Directive on combating terrorism³¹¹. However, the practical use of the JPM has been met with hindrances. Pre-pandemic recommendations related to the strengthening of the JPM through examining the contractual system and simplifying the process, whereby the European Commission should have full authority from EU Member States to negotiate contracts on their behalf (boilerplate contracts), and to communicate to EU Member States that the JPM is the preferred mechanism through which to

³⁰⁷ Commission staff working document on nuclear security of March 2016.

³⁰⁸ Commission Implementing Decision (EU) [2020/414](#) of 19 March 2020 amending Implementing Decision (EU) 2019/570 as regards medical stockpiling rescEU capacities (notified under document C(2020) 1827) (Text with EEA relevance) C/2020/1827, OJ L 82I, 19.3.2020, p. 1–5, European Commission, March 2020.

³⁰⁹ European Commission, COVID-19: Commission creates first ever rescEU stockpile of medical equipment, press release, [IP/20/476](#), March 2020.

³¹⁰ European Commission, Coronavirus: rescEU medical stockpile expands in 4 Member States [website](#), January 2021.

³¹¹ Under this Directive, EU Member States are required to provide medical treatment to victims of CBRN attacks for as long as required. See: [Directive \(EU\) 2017/541](#) of the European Parliament and of the Council of 15 March 2017 on combating terrorism and replacing Council Framework Decision 2002/475/JHA and amending Council Decision 2005/671/JHA, OJ L 88, 31.3.2017, p. 6–21), article 24.

acquire CBRN medical countermeasures³¹². In the same study, it was recommended to establish closer links/new ways of cooperation between the **industry**, EU Member States and EU institutions to ensure the industry is aware of future procurement needs³¹³. Several developments were observable since these recommendations were issued. In 2019 the European Commission signed a framework contract with a number of EU Member States (representing approximately half of the European population) on the joint procurement of pandemic influenza vaccines. Shortly after the signing, the COVID-19 pandemic rapidly advanced the JPM. Until the pandemic occurred, there was no legal basis for a full European Commission negotiation and procurement mandate on behalf of all EU Member States and there were no concrete plans to further strengthen/expand the JPM beyond the developments from 2019. During the pandemic, however, the EU negotiated on behalf of the EU Member States for the procurement of medical countermeasures, albeit on an ad-hoc basis. It nonetheless showed that the European Commission can play a meaningful role in the acquisition of for example, vaccines and PPE, and as such, the added value of the JPM was strengthened. Nonetheless, there have been no advances on the specific marketing of the JPM as the preferred mechanism through which to acquire broader CBRN medical countermeasures.

5.4 Relation to the Updated Threat Landscape

Chapter 4 has shown the complexities arising from CBRN threats, with multiple actors and scenarios to consider, affected by rapid technological change and involving threats ranging from natural sources through accidental releases and negligence in the manufacturing and use of CBRN materials to malevolent uses by criminal, terrorists or state actors. The response to these threats, too, will have to involve a range of actors and tools that can be mobilised and operate together in configurations that are tailored to the specifics of an incident in terms of its nature, size, location and context. In a major EU level incident, the actors include the EU Member States, the Council Presidency and the Council, the European Commission, the EEAS, relevant EU agencies, experts from EU Member States and international partners as appropriate³¹⁴.

At the same time, risk assessments have consistently placed CBRN threats into the category of low probability – high consequence *potential*. Whilst there have been more than 500 recorded CBRN incidents since 1990³¹⁵, the absolute majority of recorded incidents have affected only small numbers of individuals, with limited consequences for the populations of the EU Member States concerned. In its 2020 CBRN threats and incidents report³¹⁶, the Swedish Defence Research Agency (FOI), included for the year 2020 altogether 74 incidents involving radioactive and nuclear materials as recorded in the IAEA Incident and Trafficking Database (52 in Europe, and mostly regulatory breaches), 20 chemical incidents (10 in Europe), 4 biological incidents (none in Europe) and several incidents with ‘white powder’. At the same time, the report states that during that year, no known CBRN related terrorist attack occurred. The year, instead, was dominated by the COVID-19 pandemic.

Thus, the European preparedness and response capacity has to be adaptable to the nature and size of an incident. Most incidents will be well within the capabilities of EU Member States to manage. Even in case of cross border incidents, the EU Member States involved will usually have the capacity to manage an incident response on a bilateral basis. On the other hand, the COVID-19 crisis has been a reminder that there are CBRN situations where the response capacity of individual EU Member States can be quickly saturated and overwhelmed and where global as well as pan-European cooperation, solidarity and

³¹² European Parliament, ‘[Member States’ Preparedness for CBRN Threats](#)’, 2019, p. 34.

³¹³ European Parliament, ‘[Member States’ Preparedness for CBRN Threats](#)’, 2019, p. 35.

³¹⁴ V. Edelmann and U. Kurt and P. Merritt, “Civil-military preparedness against CBRN threats in Europe – current threats and responses”, FINABEL European Army Interoperability Center - Food for thought, 2020.

³¹⁵ Edelmann, quoting Ackerman & Jacome 2018, 2020.

³¹⁶ M. Normark, et al., CBRN Threats and Incidents Involving Non-state Actors – 2020 Annual Report, Stockholm: Swedish Defence Research Agency, 2021.

coordination, and depending on the circumstances, cooperation and coordination with external actors, are absolutely essential.

This calls for a modular, task force like approach with a range of capacities and actors at Member State as well as EU level so that a response can be assembled quickly from existing assets, tailored to the particular situation. The Team Europe approach taken during the COVID-19 pandemic was an example of how such tailored responses can be mounted.

To be able to implement such a modular, competence and capacity-based, all-hazards and multiple actors ('All-of-Government' at EU level) response require that the response is built into the system from the top; that procedures for joint planning, operational coordination, effective and secure communications, etc. are in place and have been tested in training and exercises at different levels (from table top and command post exercises to the occasional fully-fledged field exercise); that the issue of harmonisation and interoperability of procedures and equipment have been resolved; and that the interaction between the European Commission and EU Member States, and Parliament, in the management of crisis situations is further enhanced. This applies, of course, to any major crisis affecting the EU as a whole, but surely it applies to the prevention and detection of, response to, and consequence mitigation of CBRN threats.

6 Conclusions and recommendations for reinforcing the EU's preparedness

6.1 EU and international level cooperation and agreements

This Chapter formulates concrete recommendations based on the findings from analysing the threat landscape and the identified gaps in the EU's preparedness. The purpose of the recommendations is to learn from previous experiences and improve the EU's preparedness against the CBRN threats. The recommendations are written to the EU's various institutions and bodies and focus on building systemic resilience and proposing solutions for the EU to deal with CBRN threats. Particular attention is paid to the European Parliament's role and legislative and non-legislative powers³¹⁷, as well as recently introduced tools such as the UCPM and PESCO.

6.1.1 Ensuring that the CBRN CoE Initiative becomes a genuine EU flagship programme

The EEAS, together with FPI and the relevant DGs of the European Commission, should ensure that the CBRN CoE Initiative becomes a genuine **EU flagship programme** within the European Union. The CBRN CoE Initiative is recognised by partner regions and countries outside the EU as a significant contribution to global governance and security in the CBRN area. However, it still lacks a degree of strategic direction from the EU based on a risk assessment. It could also be more effective in mirroring internal CBRN threat mitigation efforts of the EU and its Member States in partner countries and propagating a culture of responsibility in the CBRN domain. This will require political leadership, integration of the CBRN CoE Initiative into broader external actions as a priority, and secure funding. It will also require the EU delegations in partner countries that participate in the initiative (and in particular those that host Regional Secretariats) to take on a more supportive and active role in supporting the initiative and conveying

³¹⁷ The Lisbon treaty, which came into force in late 2009, brought new law-making powers to the European Parliament and put it on an equal footing with the Council of Ministers in deciding what the EU does and how money is spent. It also changed the way the Parliament works together with other institutions and gave MEPs more influence on who runs the EU. The Lisbon treaty increased the ability of the EU and its Parliament to act and deliver. It extended Parliament's full legislative power to more than 40 new fields, including energy, security, justice and EU funds. The EP Parliament also gained the power to approve the entire EU budget together with the Council. The following recommendations are grouped around the powers of the European Parliament.

strategic direction in line with EU policies and strategies in the WMD/CBRN areas. At the same time, this would also enhance the ability to transpose technical guidance, standards and best practices to participating partner countries and promote two-way exchanges between the EU and partner countries.

Recommendation 1: The EP may consider requesting the High Representative/Vice President of the European Commission to report to EP on the past achievements and current status of the CBRN CoE Initiative and the plans for its future development as a platform for cooperation and sharing best practices with the participating countries and regions.

6.1.2 Ensuring strategic coordination between priorities adopted and projects implemented under the CBRN CoE Initiative and the actions supported by the EU under CFSP Council Decisions.

The EEAS is responsible at the planning stage for formulating the CFSP actions, whilst the FPI is mandated to ensure that these actions are consistent and coherent with actions implemented under the IcSP or, in the future, the NDICI. The latter includes the CBRN Centres of Excellence Initiative.

Recommendation 2: The EP may consider requesting, from time to time, a report by the High Representative / Vice President of the European Commission on the actions implemented under those two complementary lines of support for partner countries.

6.1.3 Revitalising the partnership with the United States

Across all EU bodies, it is important to revitalise the partnership with the United States, including with regard to WMD non-proliferation and arms control and the prevention of and preparedness for CBRN threats. This also includes the strengthening of multilateral mechanisms and institutions in this domain, but equally important is to foster the bilateral relations between the EU and the US at all levels.

A much closer partnership between the European Parliament and the US Congress is realistic today after the Lisbon Treaty gave additional powers to the EP.

Recommendation 3: It is recommended that the EP and the US Congress include issues related to CBRN threats and societal resilience against them in their Transatlantic Legislators' Dialogue (TLD)³¹⁸.

³¹⁸ The Transatlantic Legislators' Dialogue (TLD) works to enhance exchanges between legislators working in the European Parliament and the US Congress. It was officially established as a formal response by Parliament and Congress to the commitments

6.1.4 Working towards a revival of the Joint Comprehensive Plan of Action with Iran

The EU should continue working towards a revival of the JCPOA with Iran in which Iran agreed to eliminate its stockpile of medium-enriched uranium, cut its stockpile of low-enriched uranium by 98%, and reduce by about two-thirds the number of its gas centrifuges for 13 years³¹⁹. The EP has, on several occasions, pledged its support for the JCPOA.

Recommendation 4: The EP should continue monitoring the situation in Iran and the Middle East and may wish to consider adopting a resolution in support of the early revival of the JCPOA..

6.1.5 Supporting sanctions against the violations of the international regimes against CBRN weapons

The EU is championing suitable sanctions against the violations of the international regimes against CBRN weapons, including through targeted sanctions in the context of the partnership against the impunity for the use of chemical weapons, restrictive measures in the field of WMD non-proliferation, as well as sanctions in the context of combating terrorism.

Recommendation 5: The EP may wish to ask the High Representative/Vice President of the European Commission to prepare a report to Parliament about the effectiveness of the EU's sanctions regime with regard to violations of international regimes against CBRN weapons. The EP should also promote debates about the important issue of the loss of regulatory control over nuclear and other radioactive materials.

6.1.6 Forging deeper cooperation with NATO

At the practical and operational levels, it will be important to forge deeper cooperation with NATO, including in the area of CBRN threat prevention and response. This extends to political dialogue as well as practical measures. Common challenges facing both the EU and NATO include the countering of hybrid threats, enhancing operational cooperation, cyber security and defence, strengthening defence capabilities, the defence industry and research, conducting exercises, and supporting the capacity-building efforts undertaken by Eastern and Southern partners. These common challenges overlap substantially with the threats posed in the field of CBRN. Close cooperation between the EU and NATO is important for the development of an international 'comprehensive approach' to crisis management and operations. The European Commission should strengthen its cooperation and coordination with NATO in operational and technical areas, including training, exercises, and, where possible, the adoption of common procedures and standards.

set in the New Transatlantic Agenda of 1995. In practical terms, the TLD comprises bi-annual meetings alternately in Europe and the US. When these meetings are held in the EU, they usually take place in the capital of the country holding the EU presidency while the meetings in Washington, DC also provide an opportunity for MEPs to engage with US Senator. The aim of the dialogue is to maintain policy-oriented cooperation in key areas, especially where the two Houses have responsibility as legislators; Transatlantic Legislator's Dialogue [webpage](#), 2021.

³¹⁹ K. Robinson, What is the Iran Nuclear Deal, Council on Foreign Relations [webpage](#), 29.06.2021.

Recommendation 6: The European Parliament's delegation to the NATO Parliamentary Assembly (DNAT) can make an important contribution to further developing the relationship between the EU and NATO while respecting the independent nature of both organisations. CBRN threat preparedness and civilian as well as military cooperation between the EU and NATO should be a regular element in this dialogue.

6.1.7 Contributing to the implementation of an eventual agreement on the denuclearisation of the Korean Peninsula

The EU should stand ready to contribute to the implementation of an eventual agreement on the denuclearisation of the Korean Peninsula, particularly in its technical aspects. New opportunities may arise with the new US administration setting out its policy options vis-à-vis North Korea. At the same time, the EU should continue to support Seoul's efforts to engage with the North to achieve peace and prosperity on the peninsula.

Recommendation 7: It is recommended that the EP supports international agreements that foster international collaboration, which contribute to increased security in the area of CBRN. In particular, the EP should continue monitoring the situation on the Korean Peninsula, working through its Delegation for Relations with the Korean Peninsula (DKOR). It may also consider asking the High Representative/Vice-President of the European Commission again to report back to Parliament to ensure that the issue remains high on the EU's political agenda.

6.2 EU Preparedness

6.2.1 Reviewing the lessons from the EU response to the COVID-19 pandemic, the chemical weapons use in Syria and incidents and threats of CBRN agents being used by non-state actors in European countries

With respect to preparedness capacities for major CBRN incidents, it is essential to review the lessons from the EU response to the COVID-19 pandemic, the chemical weapons use in Syria, and incidents and threats of CBRN agents being used by non-state actors in European countries, the uses of new types of chemical weapons from the Novichok group of chemical agents in assassination attempts, and other relevant scenarios that could have involved mass casualty situations as the result of the release of CBRN agents, to ensure that in a significant European crisis situation that affects a large number of EU Member States and/or overwhelms the response capacity of some of them, stronger direction and coordination can be exerted from the centre of the EU.

This would require using an 'all of government' Task Force approach, perhaps similar to Team Europe during the COVID-19 response, with the clearly defined authority of the European Commission leadership, the Council Presidency and the EP, and well-defined roles of the EEAS, the European Commission DGs and

EU agencies that have competence and mandates with regard to the response action depending on the context and situation, supported by mechanisms such as the UCPM and/or as necessary military structures/assets.

Such an approach cannot be improvised, but it needs systematic long-term engagement and investment, for example, in the form of a standing Task Force.

It could also be supported by an EU Centre of Excellence on CBRN risk mitigation (see below), and should be able to deploy a fully operational multilateral CBRN response unit perhaps modelled on the NATO CBRN defence battalion and supported by EU Member States on a voluntary basis (following the example of PESCO or as an additional PESCO project). In addition, such a standing Task Force would strengthen the EU's response capabilities and enable more effective operational cooperation and coordination between EU Member States and between the EU and external partners such as the US and NATO in particular.

Recommendation 8: The EP may wish to ask the President of the European Commission to report to the EP about the lessons learned from these recent crises, setting out concrete steps and measures to foster solidarity among EU Member States, ensure strategic guidance and close coordination among all relevant partners and EU bodies/agencies, and implement effective crisis management at EU level.

6.2.2 Setting up an EU CBRN Centre of Excellence

It is proposed to consider setting up an EU CBRN Centre of Excellence as a CBRN competence centre for the EU. Such a centre would serve as a reference point for other EU bodies and agencies that work within their specific mandates on aspects of CBRN threat/risk reduction, preparedness, response and mitigation. It would also be a point of reference and cooperation for EU Member States governments, industry, innovation centres, and civil society organisations engaged in CBRN issues. At the same time, the EU CBRN CoE could play an important role in transferring EU expertise and best practices through the CBRN CoE Initiative to partner countries in the EU neighbourhood in Eastern Europe, the Balkan and the Mediterranean region, and globally. Such a EU CBRN Centre of Excellence could also facilitate close collaboration with the industry, which is vital in ensuring that adequate levels of countermeasures are developed and distributed. Since the industry can only respond to a threat once it has been defined, an EU CBRN Centre of Excellence could **be charged with interacting with the industry to inform them of the European view of the threat and identify potential products that could be acquired to counter the threat.**

Recommendation 9: The EP may consider initiating the setting up of this Centre of Excellence as a pilot project to test and demonstrate the feasibility and utility of such a centre for the preparation of response measures to an EU wide CBRN crisis situation and as a reach back capacity for EU entities, EU Member States and other partners. The CoE would also be a competence centre in support of the EU CBRN Centres of Excellence Initiative in partner regions where it could provide technical guidance on standards and best practices and for partners such as NATO.

6.2.3 Linking CBRN preparedness to other cross-cutting issues

Under the CBRN Action Plan, CBRN preparedness and response has been primarily driven by State security concerns and thus was oriented towards dealing with terrorist (as well as State level) CBRN threats. The COVID-19 pandemic was a reminder that CBRN preparedness cannot be limited to those types of threat scenarios but requires an all-hazard approach. This has long been recognised in EU policy documents and strategies and is consistent with the approach taken under the CBRN CoE Initiative. This broader focus on CBRN risks no matter what their origin (natural, accidental, malevolent) also broadens the dimensions of CBRN preparedness beyond security and captures the broader issues of safety and protection of the citizens and the environment. CBRN preparedness, therefore, should be set into a much broader framework of safety and security and linked to hybrid threats and other crosscutting issues that have CBRN dimensions, such as climate change, safety and security of drinking water and food supplies.

Recommendation 10: The EP may consider monitoring how CBRN security measures are being implemented by different EU bodies/agencies within the scope of their respective mandate to benefit from synergies in programmes and actions.

6.2.4 Introducing overarching crisis situation legislation

Today, there is no EU overarching legislation in the area of CBRN preparedness. In response to the COVID-19 pandemic, the EU and the WHO have proposed negotiating a possible new international instrument on pandemics³²⁰. As this initiative further matures, appropriate EU legislation may also have to be developed. The EP should consider whether this ought to be legislation on pandemics only or legislation on the EU response to *any* major crisis situation that poses a serious threat to the EU as a whole (e.g. by exceeding the crisis management capacity of EU Member States and/or affecting a large number of them). This could include legislative elements regarding an acute emergency caused by the climate crisis, major CBRN threats with potential consequences across the EU, and other urgent issues that require crisis management at a European level.

Recommendation 11: The EP should be prepared to participate in this process and participate in the ordinary legislative process towards relevant new legislation (or by adapting multiple existing legislative instruments) in the area of CBRN.

One aspect of such legislation may be setting up a standing EU coordination mechanism for planning and coordination of the EU response to large crisis situations, including CBRN incidents, and for ensuring stronger operational cooperation with NATO and other partners. **During COVID-19**, for example, the sovereignty of the EU Member States in public health has often taken precedence over the directives issued by the EU, leading at times to disorganisation at EU level, a lack of coordination of actions, and delays caused by administrative burden. Experiences from COVID-19 and incidents involving CBRN agents must be taken into account in the future to improve the EU's responsiveness in the event of a major crisis. Some of the CBRN related projects under PESCO may provide useful practical elements needed in such a

³²⁰ European Council, 'An international treaty on pandemic prevention and preparedness' [webpage](#), 15.06.2021.

coordination mechanism. However, what is needed is that a critical mass of EU Member States participates in these projects and that they soon reach full operational readiness.

Recommendation 12: The EP may consider monitoring the situation, supported by the Member State coordinators of the respective projects and the PESCO Secretariat.

6.2.5 Strengthening the response capacity to CBRN incidents through building up indigenous production capacities for protective equipment

EU Member States and the European Commission should take measures to strengthen the response capacity to CBRN incidents, including pandemics, through building up indigenous production capacities for protective equipment and supplies (medical as well as nonmedical) in the EU, as well as 'ramp-up capacity' to start production of critical items not manufactured in the EU during a crisis. This would require not merely the setting up of manufacturing capacities but also to ensure compatible or common standards of the equipment to ensure interoperability. The above proposed EU CBRN CoE could serve as a competence centre for guiding such an endeavour, together with DG HOME's CoU.

The European Commission should also take measures to improve and stabilise the situation with regard to common stockpiles of critical items needed in a major EU wide crisis scenario. With respect to medical countermeasures, the steps taken under the EU Civil Protection Mechanism (rescEU stockpiles) are going in the right direction, but if the system heavily relies on stockpiles procured and maintained by individual EU Member States, problems are to be expected with regard to harmonisation of standards and procedures as well as interoperability. Steps are also needed to meet critical needs with regard to non-medical items, including equipment needed by responders.

The European Commission should also be encouraged to improve the logistical systems in the EU, particularly regarding the interface between civilian and military assets. During the COVID-19 crisis, this interaction has worked well with the public health sector in the lead and military assets in response/assistance roles. It is not certain, however, how this interaction would play out in a terrorist scenario with organisations from the security sector in the lead and with a more complex operational framework – in particular, if such terrorist scenarios were to result in large-scale consequences for the population and require instantaneous and comprehensive information sharing between different sectors and/or EU Member States as well as crisis communications to populations.

Crisis communication needs to be improved, better prepared for and more effectively coordinated at EU Member States and EU levels. This relates to crisis management and preparedness in general, not merely to a response to CBRN crisis situations. It will be particularly important for events that affect populations across multiple EU Member States and also involve cyber security threats, disinformation, conspiracy theories, and other forms of hybrid threats. The EP may consider monitoring the situation in these areas and encourage collaborations within the EU on these issues. It may also wish to encourage the European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE) to continue including CBRN scenarios in its work, and- should an EU CoE on CBRN issue be established – to work closely together with this entity.

It will also be important to further enhance the **collaborations of European institutions and agencies** that have mandates with respect to CBRN risk mitigation with partner organisations in other countries and/or internationally that work in similar fields. An example is the working relationship between Europol and INTERPOL, including with regard to the interfacing of response systems in the law enforcement and

public health domains. Similar relationships exist in the public health sector, in the field of civil defence and in humanitarian assistance³²¹.

Recommendation 13: The EP may wish to keep this issue under review and request, from time to time, relevant EU agencies to report on the situation with regard to such collaborations and coordination with international partners.

³²¹ Report on strengthening chemical, biological, radiological and nuclear security in the European Union – an EU CBRN Action Plan, European Parliament, [2010/2114\(INI\)](#), 2010, para 1.

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Annex II List of interviewed individuals³²²

Table II.1 List of interviewed individuals

Name	Organisation	Interviewed by	Date and time of interview	Interview code
Maurizio Martellini (Lidia Falzone also present)	University of Insubria, CoE	Ralf Trapp, Hanna Mohn	06.05.2021	INTV01
Louis-Victor Bril		Ralf Trapp, Sarah Leonard, Hanna Mohn	10.05.2021	INTV02
Tristan Simonart	DG ECHO	Ralf Trapp, Hanna Mohn	18.05.2021	INTV03
Bruno Duprè	EEAS	Ralf Trapp, Hanna Mohn	21.05.2021	INTV04
Anonymous	DG HOME	Ralf Trapp, Hanna Mohn	02.06.2021	INTV05
Dr Iris Hunger	Federal Information Centre for Biological Threats and Special Pathogens, Robert Koch-Institute Berlin, Germany	Ralf Trapp	04.05.2021	INTV06

Table II.2 List of individuals from whom written responses were received

Name	Function	Contribution code
Cecile van de Konijnenburg	Public health emergency advisor/expert at the Federal Public Service of Health in Belgium	WC01
Lt.Col. Bernd Allert,	Chief Concepts and Doctrine, NATO Joint CBRN Defence Centre of Excellence, Vyškov	WC02
Lt.Col. Stephan Kliefoth	Military Policy Department, Permanent Representation of the Federal Republic of Germany to the European Union	WC03
R MCol. Claude Lefebvre	Ret. Colonel of the French Army, specialist in the field of NRBC defence, Expert in NRBC defence technologies since 2012 with state or private establishments and organizations, Member of the Scientific Council of the Institute of Advanced Geopolitical Studies	WC04
J Marsia	Founding President, European Defense Society AISBL (S&D) (previously in different functions at the Belgian Ministry of Defence)	WC05
Doctor Lucien Bodson	Anaesthesiologist-Resuscitator-Emergency physician, management of exceptional situations; retirement; adviser CHU de Liège; DGC19 advisor to the Walloon government (Belgium); former Belgian army reserve doctor officer; former firefighter doctor.	WC06

³²² The study team conducted semi-structured interviews based on a list of pre-determined questions. However, interviewees were able to expand in greater depth on the issues they found most relevant.

Annex III Overview of relevant EP discussions on CBRN

Table III.1 Overview of relevant EP discussions on CBRN

What	When/Where	Title/Topic	Context/Short description
Debate (which followed an EP resolution adopted on March 15, 2018)	April 17, 2018	Situation in Syria	Use of chemical weapons and attacks in Syria
Workshop	November 19, 2018	EU preparedness against CBRN weapons	The European Union faces an increasingly challenging security environment, with a climate of international instability and a level of tension not seen since the end of the Cold War. Repeated chemical attacks by both State and non-state actors in the context of the Syrian conflict, the Novichok attack in Salisbury and the disruption of two ricine terror plots in Germany and in France in 2018 came all as stark reminders that the threat remains real and that EU Member States could be affected. In this context, the EU continues to strengthen its capacities in the field of CBRN preparedness and response. The use of EU mechanisms and EU Member States' military assets is one of the possibilities for strengthening prevention capacities that must be explored more thoroughly.
Debate and vote	September 15 and 17, 2020	European Parliament resolution on the situation in Russia: the poisoning of Alexei Navalny	During the plenary session of the European Parliament in Brussels, MEPs debate (15/09) and vote a resolution on the situation in Russia and the poisoning of Alexei Navalny
Debate and vote	October 20-21, 2020	MEPs to reiterate support for Treaty on Non-Proliferation of Nuclear Weapons	Parliament is expected to recommend that the Council and the EU foreign policy chief should reaffirm the EU's and EU Member States' full support to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the most important international instrument for regulating the nuclear regime in the last fifty years. The 2020 Review Conference of the treaty will take place in a particularly challenging international security context; no progress has been made in the denuclearisation of the Korean peninsula, the US has withdrawn from the Joint Comprehensive Plan of Action (JCPOA) with Iran, the INF Treaty has collapsed, and negotiations to extend the new START Treaty between Russia and the US are at a stalemate.
Debate	March 15, 2021	COVID-19 vaccines: MEPs debate concerns about virus mutation	On Monday, Members of the Environment, Public Health and Food Safety (ENVI) Committee will question representatives from the European Medicines Agency (EMA), the European Centre for Disease Prevention and Control (ECDC) and the World Health Organisation

			(WHO) on the efficacy of vaccines against mutations of the COVID-19 virus
Debate	April 15, 2021	EP Debate with the Organisation for the Prohibition of Chemical Weapons (OPCW) – Subcommittee on Security and Defence	SEDE Members will welcome for the first time the Director-General of the Organisation for the Prohibition of Chemical Weapons (OPCW), Fernando Arias. Since its creation, the OPCW has been instrumental in the verified destruction of 90% of the world's declared stockpile of chemical agents. However, in the past decade, the norm against the use of chemical weapons has started showing signs of erosion and the threat posed by chemical warfare is considered as one of the most pressing global security threats. Members will therefore discuss with Ambassador Arias possible ways to contain the spread and use of chemical weapons inside and outside of the military domain and to bring the countries violating the provisions of the Chemical Weapons Convention, back to full compliance.
Debate and vote (?)	April 22, 2021	European Parliament resolution on chemical residues in the Baltic Sea, based on Petitions Nos 1328/2019 and 0406/2020	See title.

Annex IV Overview of recent studies on CBRN commissioned by the European Parliament

Table IV.1 Recent studies on CBRN commissioned by the European Parliament

Year	Type	Title	Responsible unit / Requesting committee
2020	At a glance	The poisoning of Alexey Navalny	European Parliamentary Research Service
2020	In-depth analysis	How the COVID-19 crisis has affected security and defence-related aspects for the EU	Policy Department for External Relations at the request of the Sub Committee on Security and Defence (SEDE)
2020	Briefing	The role of armed forces in the fight against pandemics	European Parliamentary Research Service
2020	Briefing	Cross-border threats to health: EU action on preparedness and response	European Parliamentary Research Service
2019	Study	Cross-border nuclear safety, liability and cooperation in the European Union	Policy Department for Citizens' Rights and Constitutional Affairs at the request of the Committee on Petitions (PETI)
2019	Workshop report/ Study	EU preparedness against CBRN weapons	Policy Department for External Relations at the request of the Sub Committee on Security and Defence (SEDE)
2018	Study	Member States' Preparedness for CBRN Threats	Policy Department for Citizens' Rights and Constitutional Affairs at the request of the Special Committee on Terrorism (TERR)
2018	In-depth analysis	EU Civil Protection Responding to CBRN Incidents and Attacks	Policy Department for Citizens' Rights and Constitutional Affairs at the request of the Special Committee on Terrorism (TERR)
2018	In-depth analysis	The Mechanisms of Prevention and Detection of CBRN Illegal Material Transfers Across Borders and Within the EU	Policy Department for Citizens' Rights and Constitutional Affairs at the request of the Special Committee on Terrorism (TERR)

Annex V CFCP actions in the area of WMD non-proliferation and disarmament

Table V.1 CFCP actions in the area of WMD non-proliferation and disarmament

Funding Objective(s)	Organisation(s) Supported	Council Decision(s)	Total funding approved (€)
Strengthening biosafety and biosecurity on regional basis	WHO (Asia), OAS (Latin America)	2013/668/CFSP CFPS/2019/2108	4,465,709
Reinforcement, universalisation and implementation of the Biological Weapons Convention	UNODA-ISU	CFSP/2016/51 CFSP/2019/97	5,369,857
Universalisation, implementation and verification of the Chemical Weapons Convention; strengthening chemical safety and security	OPCW	CFSP/2015/259 CFSP/2017/38 CFSP/2019/538	13,753,232
Destruction of Libya's chemical weapons and CW production facilities	OPCW	CFSP/2017/2303	1,003,446
Clean-up operation at the former Libyan CW storage site	OPCW	CFSP/2017/2302	2,544,764
Establishment of the OPCW-UN Joint Investigative Mechanism (JIM) to identify perpetrators of chemical attacks in Syria	OPCW and UNODA	CFSP/2015/2215	4,586,096
Strengthening chemical as well as biological safety and security in the Ukraine	OSCE	CFSP/2017/1252 CFSP/2019/1296	3,344,355
Maintenance and technical enhancement of the international monitoring and verification system to detect nuclear weapons tests	CTBTO Preparatory Commission	CFSP/2015/1837 CFSP/2018/298 CFSP/2020/901	13,908,400
Support for the review of the Nuclear Non-Proliferation Treaty (NPT)	UNODA	CFSP/2019/615	1,299,884
Universalisation and effective implementation of the International Convention for the Suppression of Acts of Nuclear Terrorism	UNODC and UNCCT	CFSP/2018/1939	4,996,965
Strengthening nuclear security, support for EU strategy against WMD proliferation	IAEA	CFSP/2016/2383 (CFSP) 2020/1656	19,557,399
Establishment and secure management of the Low Enriched Uranium (LEU) Bank in Kazakhstan, managed by the IAEA	IAEA	CFSP/2016/2001	4,362,200
Support of the implementation of UN Security Council Resolution 1540 (2004) on the non-proliferation of weapons of mass destruction and their means of delivery	UNODA	CFSP/2017/809	2,340,000

Promotion of adherence to The Hague Code of Conduct on Missile Non-proliferation	The Hague Code of Conduct	2014/913/CFSP CFSP/2017/2370	2,868,120
Support for countries in Latin America and the Caribbean to participate in high-level expert preparatory group consultations for the fissile material cut-off treaty	UNODA	CFSP/2017/2284	1,220,881
Support for a confidence-building process leading towards the establishment of a WMD free zone in the Middle East	UNIDIR	CFSP/219/938	2,856,278
Networking and creation of new ideas to promote non-proliferation and disarmament, and exchanges with partners outside the EU	Consortium of Independent EU Think Tanks	2014/129/CFSP CFSP/2018/299	8,068,163

Annex VI CBRN Threat Matrix

Table VI.1 CBRN Threat Matrix

	State actors	Non-state actors	Accident / Industrial Releases	Natural Causes
Chemical	<p>CWC as legal barrier (almost universal, progress with destruction of declared stockpiles at 98.7 %, OPCW oversight over implementation and verification);</p> <p>Low technological threshold;</p> <p>Large scale CW battlefield uses seen as unlikely but recent cases of use in conflict scenarios such as in Syria; Assassinations (Russia and DPRK)</p>	<p>Certain groups have shown an interest in acquiring chemical weapons;</p> <p>Use of mustard agent by ISIS in Syria/Iraq confirmed by OPCW/UN;</p> <p>Technological hurdles relatively low for crude CW but tacit knowledge remains critical for effective weaponisation</p> <p>National controls including export and transfer controls to reduce access</p>	<p>Industrial activity and trade in chemical materials happens at global scale, with inherent risks of accidents and spills;</p> <p>Risks for people and environment mitigated by measures to enhance safety and security during manufacturing, storage, transport and use;</p> <p>Human activity resulting in releases of pollutants affecting access to clean air, water, the food chain, and contributing to climate change</p>	<p>Chemical disasters of natural origin often localized but can have significant impact on people and the environment (example toxic gases released near active volcanoes);</p> <p>Natural gas emissions with impact on climate change (e.g., methane)</p>
Biological	<p>BWC as legal barrier (almost universal, no verification system, ISU supporting EU Member States efforts to implement but institutionally weak)</p> <p>Advances in life sciences with potential to increase weapons potential in key areas (example synthetic biology) but also to enhance protections against CBW</p>	<p>Individuals (lone actors, associates of terrorist organizations) have shown interest in acquiring and using BW;</p> <p>Anthrax cases in the US (as well as hoaxes), Ricin cases in the US and European countries;</p> <p>Concerns about threats emanating from life science advance but limitations regarding effective weaponisation</p>	<p>Potential of accidental releases from laboratories and biological manufacturing facilities (examples speculations over whether a lab leak might have been the origin of a food and mouth disease outbreak in the UK or the current COVID-19 outbreak)</p>	<p>New and emerging infectious diseases with potential of triggering a regional outbreak or pandemic (examples influenza and corona viruses including COVID-19)</p>
Radiological	<p>No specific legal barriers (no progress with negotiating a RW Treaty at the Conference for Disarmament for many years)</p>	<p>Potential of acquisition of radioactive materials (orphan sources, sources used at civilian facilities such as hospitals) to manufacture a 'dirty bomb'</p>	<p>Potential for accidental releases of radioactive materials from legitimate uses in industry, research labs, hospitals</p>	<p>Releases of radioactive materials from natural reservoirs, for example as a consequence of volcanic activity</p>

	No indication that States are pursuing RW development and acquisition			
Nuclear	<p>Legal barriers in certain areas (including NPT, CTBT – not yet in force, ICSANT) but at the same time, modernization of existing NW systems ongoing in several NW States;</p> <p>Risk that NW possessors may get entangled in local/regional conflict or lose control of their NW</p> <p>Nuclear proliferation risks (examples Iran, DPRK)</p>	Technological hurdles put acquisition of a NW usually beyond the reach of non-state actors but there remains a risk of non-state actors manufacturing a crude nuclear device or diverting a nuclear device from a NW State	<p>Accident at a nuclear reactor with release of nuclear material into the environment (example Chernobyl), affecting populations and the environment locally and at large distance;</p> <p>Accidents during transportation and storage of nuclear fuel, spent fuel / nuclear waste, or other nuclear materials</p>	Natural catastrophes affecting nuclear reactor sites and resulting in breaches of containments and/or reactor meltdown (example Fukushima), with consequences for the environment and populations

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