PROGETTO PRIN 2017

International legal obligations related to Prevention, Preparedness, Response and Recovery from CBRN events and status of their implementation in Italy (CBRN-ITALY)

Project n° 20175M8L32

Duration: 36 months (March 2020 – February 2023)

The challenge of outlining the CRBN(E) definitional framework: agents, events and actors

Task 1.1

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May 2020

About this publication

This paper is the outcome of research carried out in the scope of the project CBRN-ITALY on International legal obligations related to Prevention, Preparedness, Response and Recovery from CBRN events and status of their implementation in Italy.

CBRN-ITALY has been funded by the Italian Ministry of Education, University and Research (MIUR) under the PRIN Programme (Progetti di Rilevante Interesse Nazionale) under grant n° 20175M8L32, with a duration of 36 months (March 2020 – February 2023). The research is carried out by four Universities: Scuola Superiore Sant'Anna, Institute of Law, Politics, Development (DIRPOLIS), Università di Bologna, Università di Firenze, Università di Torino.

The project aims at developing a common understanding of CBRN events and of actors involved (stage 1), at mapping obligations stemming from the wide range of applicable norms of International Law and European Union Law (stage 2), at exploring the implementation of applicable international obligations in Italy (stage 3) and at providing recommendations to address the gaps in the International, European and Italian legal and policy frameworks in all phases of the CBRN emergency management cycle (stage 4). The research activities are thus structured around four stages: 1. Definitions, 2. Mapping International and Regional Obligations, 3. Assessing the situation in Italy, 4. Providing recommendations.

For further information on the PRIN Project CBRN-ITALY, please visit:
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Table of contents

Abstract

This paper aims at giving a preliminary overview on CBRN agents, events and actors in order to better define the project research agenda. CBRN threats and events may include the use of chemical, biological, and nuclear weapons (weapons of mass destruction – WMD), both by State and non-state actors (including terrorist movements); the use of CBRN agents for smaller scale crimes; industrial accidents involving release of CBRN agents into the environment; natural disasters or other calamities and the disposal of toxic waste. Hence, the role of private actors such as multinational enterprises is also relevant. A set of relevant examples is provided in every paragraph.

At a first glance, it appears that States and IOs expressly use the CBRN label mainly when dealing with security and defence issues and strategies – especially in a counter-terrorism perspective - whereas the CBRN categorization is very rarely employed when addressing the consequences of natural disasters and public health emergencies. However, in the project research agenda and in this paper as well, the CBRN notion in intended in a broad manner with a view to including a variety of different events thus adopting an all-hazards approach.

In the concluding remarks, a few possible lines of investigation are suggested. For instance, it may be worth to investigate, in the various phases of the research, in which contexts the concept of CBRN events has been gradually enlarged to embrace an all-hazards approach (for instance in IOs documents) and in which areas it was instead never adopted as an appropriate label (disaster law or health regulations). It may also be worth investigating whether strategies and answers explicitly developed to respond to CBRN events in a security or counter-terrorism perspective may be useful to deal with other emergencies such as natural disasters or pandemic outbreaks.

1. CBRN threats: a blurry and (possibly) outdated definitional framework?

Since the early years of the 21st century, incidents related to chemical, biological, radiological, and nuclear agents have collectively been referred to as CBRN threats or events. However, there is no internationally or universally accepted definition or concept for CBRN threats or events, and States, International organizations (IOs) and non-state actors have given their own interpretation and designed their own strategy regarding such threats. At times, the abbreviation CBRNE is also used, to take into account the use of explosives (E) such as improvised explosive devices (IEDs) in terrorist attacks. Although a CBRN legal framework has been established in the context of some IOs, there seems to be a general lack of coordination among different actors involved, already at the stage of identifying the most relevant challenges and including them under a CBRN umbrella.

CBRN threats and events may include the use of chemical, biological, and nuclear weapons (weapons of mass destruction – WMD), both by State and non-state actors (including terrorist movements); the use of CBRN agents for smaller scale crimes; industrial accidents involving release of CBRN agents into the environment; natural disasters or other calamities[1] and the disposal of toxic waste. Hence, the role of private actors such as multinational enterprises is also relevant.

Notwithstanding the variety and diversity of CBRN agents and events, States and IOs expressly use the CBRN label mainly when dealing with security and defence issues and strategies - even more precisely in a counter-terrorism perspective - whereas the CBRN categorization is very rarely employed, for instance, when addressing the consequences of natural disasters and public health emergencies. However, in drafting our research agenda, we interpreted the CBRN notion in a broad manner with a view to including a variety of different events thus adopting an all-hazards approach. The basic assumption is that most of the rules emerging for instance in disaster law and documents drafted by IOs in that context – although not referring explicitly to CBRN threats intended in a restrictive manner – could well be applied also to all kind of incidents related to CBRN agents[2]. In fact, now might be the right time to shed some light on the CBRN label with the purpose of understanding whether it is still useful as it developed

[1] Microorganisms do not respect borders and biological events – manmade or naturally occurring – can rapidly have a global impact: a perfect example is the spread of COVID-19 at the beginning of 2020 and the ensuing world pandemic.

[2] See S. Venier, 'CBRN emergency management cycle: working definitions'(Working Paper, May 2020) and 'CBRN emergency management cycle: background considerations'(Working Paper, May 2020).

until now – i.e. in a security dimension - or it is instead gradually changing towards a category broader in scope.[3] It seems rather obvious, for instance, to ask ourselves whether global health threats should gain more attention when thinking about identifying CBRNs threats with a view to organizing adequate responses by various relevant actors in the international community and at the domestic level.

Just to give a quick introductory example of the predominant view: the UN Security Council first referred to the issue in resolution 1373 (2001), recognizing the connection between international terrorism and the illegal movement of CBRN materials[4]. A more explicit position on the issue, again in a counter-terrorism perspective, arrived with resolution 1540 (2004), through which the Security Council affirmed that the proliferation of CBRN weapons and their means of delivery and the illicit trafficking or related materials constitute a threat to international peace and security[5]. The acronym is not there yet but the contours of the concept start taking shape in the direction of setting obligations for States to counter the proliferation and smuggling of weapons of mass destruction (WMD) with the specific objective of preventing terrorist acts. Hence, a set of different measures are adopted by the SC in the following years.[6]

On the other hand, no express references to CBRN threats emerge if one looks at the UN framework for disaster relief and more in general to the area commonly labelled as Disaster risk reduction (DRR)[7]. The Sendai Framework not only does not explicitly refer to CBRN threats, but it excludes armed conflicts and it is mainly focused on natural disasters. Hence, the urgent call by the UN Secretary-General's *Special Representative for Disaster Risk Reduction*, Mami Mizutori (also heading the UN Office for Disaster Risk Reduction, UNDRR) to the disaster management agencies to continue with the development of their preparedness and response

[3] See L. Magi, D. Mauri, D. Russo, L.Vierucci, 'CBRN 'agents', 'events' and 'actors': in search of working definitions? (Working paper May 2020).

[4] Although the acronym CBRN was not yet employed: 'The Security Council (…) Notes with concern the close *connection between international terrorism* and transnational organized crime, illicit drugs, money-laundering, illegal arms trafficking, *and illegal movement of nuclear, chemical, biological and other potentially deadly materials*, and in this regard emphasizes the need to enhance coordination of efforts on national, subregional, regional and international levels in order to strengthen a global response to this serious challenge and threat to international security', UNSC Res 1373 (2001).

[5] 'Gravely concerned by the threat of illicit trafficking in nuclear, chemical, or biological weapons and their means of delivery, and related materials, which adds a new dimension to the issue of proliferation of such weapons and also poses a threat to international peace and security', UNSC Res 1540 (2004).

[6] The UN Global Counter-Terrorism Strategy calls upon the Member States, International Organizations and the UN System to: Combat smuggling of CBRN materials; Ensure that advances in biotechnology are not used for terrorist purposes; Improve border and customs controls to prevent and detect illicit trafficking of CBRN weapons and materials; Improve coordination in planning a response to a terrorist attack using CBRN weapons or materials, see https://www.un.org/counterterrorism/cct/chemical-biological-radiological-and-nuclear-terrorism.

[7] See S. Venier, 'CBRN emergency management cycle: background considerations', cit., 12; L Magi, D Mauri, D Russo, L Vierucci, 'CBRN 'agents', cit.

capacities to include biological hazards and health emergencies as a top priority.[8] The debate is ongoing on the need of a paradigm shift towards an all-hazards approach and for a transition from managing disasters to managing risks[9], as the development of the Global Risk Assessment Framework (GRAF) concept clearly shows.

Against the background of this unavoidable paradigm shift, it seems timely and appropriate to investigate whether there is room for a better coordination of international efforts to respond to global threats, including CBRN events, starting from highlighting the points of connection among the different legal frameworks (or lack thereof). This could be interesting not only at the level of the management cycle of disasters or hazardous events, but also at the basic level of definitions and connection among different set of obligations emerged and strategies developed up until now to react to different kinds of risks.

For instance, there is indeed a strong point of contact between public health and security issues as the HIV[10] challenge and more clearly the Ebola outbreak of 2014 have already shown. With resolution 2177, the SC determined that the Ebola outbreak in West Africa was a threat to international peace and security[11] and recommended to states to take a number of steps to help bring the disease under control. Despite the difference between the Ebola outbreak and more 'traditional' threats to the peace, 130 states co-sponsored resolution 2177 and were keen to consider the spread of the disease as a threat to the peace.[12] In the current situation, it is rather clear (even before undertaking and in-depth analysis) that the global outbreak of a highly contagious disease may bring exceptional humanitarian consequences[13] and a high degree of

[8] UNDDR Press Release, 12 March 2020, *UNDRR urges disaster management agencies to prioritize biological hazards*, at https://www.undrr.org/news/undrr-urges-disaster-management-agencies-prioritize-biological-hazards.

[9] 'We need a transition from managing disasters to managing risk. We need to shift from managing "conventional" hazards to engineering an improved understanding of the dynamic interactions with systemic risks. We need to explore the facilitation of a "new system of relations" that allows future theories and solutions to emerge that are "wider in scope, more accurate in prediction, and solve more problems (…) We recognize that using the same ways of understanding risk that we have always used has made us ill-equipped to manage the challenges we face. A clear example of this is the COVID-19 global emergency', Marc Gordon, Scott Williams, 'Shifting the paradigm: introducing the Global Risk Assessment Framework (GRAF)' UNDDR, 17 April 2020, available at https://www.preventionweb.net/news/view/71352.

[10] In July 2000, the Security Council noted that HIV/AIDS could potentially give rise to a threat to international peace and security, but it did not determine that it in fact constituted a threat to peace, UN Doc S/RES/1308 (2000). The SC further addressed the issue of HIV/AIDS in 2011, with UN Doc S/RES/1983 (2011). However, it did not discuss the idea that it was or might be a threat to the peace.

[11] UN Doc S/RES/2177 (2015) determined that: 'the unprecedented extent of the Ebola outbreak in Africa constitutes a threat to international peace and security'.

[12] Anna Hood identifies five categories of explanations that States gave to support the resolution, the most interesting one seems to be that of human security broadly interpreted, see A Hood, "Ebola: A Threat to the Parameters of a Threat to the Peace?" (2015) 16 MelbJlIntLaw, 29.

[13] The COVID-19 pandemic is already disrupting humanitarian aid flows, peace operations and crisis diplomacy, and threatens catastrophe for refugees and displaced people. It could damage fragile states, trigger unrest and undermine international crisis management. See 'COVID-19 and Deadly Conflict', *International crisis group* at https://www.crisisgroup.org/pandemics_public_health_deadly_conflict.

instability that may require an unprecedented effort of coordination among states also in terms of a security or peace maintenance response[14].

The UNSC could not so far adopt a resolution, due to the high tension between the US and China and to the US refusal to allow any reference to the World Health Organization[15]. The SG called the attention of the UNSC on a variety of challenges to peace and stability ensuing from the pandemics,[16] but notwithstanding two draft proposals there was no agreement among the P5.[17]

On the other hand, the UN General Assembly adopted (with a new telematics procedure) a resolution titled Global solidarity to fight the coronavirus disease 2019 (COVID-19). Here the GA notes 'with great concern the threat to human health, safety and well-being caused by the coronavirus disease 2019 (COVID-19) pandemic, which continues to spread globally'. It then 'reaffirms the central role of the United Nations system in the global response to the coronavirus disease 2019 (COVID-19) pandemic and it calls for 'intensified international cooperation to contain, mitigate and defeat the pandemic, including by exchanging information, scientific knowledge and best practices and by applying the relevant guidelines recommended by the World Health Organization'[18].

The Peace and Security Council of the African Union already expressed 'grave concern' at the outbreak of COVID 19, adding that it 'could constitute a threat to peace and security on the Continent'.[19] It subsequently adopted a resolution, on 9 March 2020, on the situation in the Novel Coronavirus Disease (COVID-19) Outbreak.[20]

In other words, this kind of event fully enters into the category of CBRN events broadly intended.

14 UNSC Press Release, 22 April 2020, *COVID-19 Pandemic Threatens Efforts to Implement Peace, Security Cooperation Framework for Great Lakes Region, Special Envoy Tells Security Council*, at https://www.un.org/press/en/2020/sc14166.doc.htm

15 A franco-tunisian draft resolution failed to be adopted in April, *International Rescue Committee*, Press Release, *UN Security Council fails to support global cease-fire*: https://www.rescue.org/press-release/un-security-council-fails-support-global-ceasefire-shows-no-response-covid-19

16 See the General remarks of the Secretary General before the Security Council, 9 April 2020, https://www.un.org/sg/en/content/sg/statement/2020-04-09/secretary-generals-remarks-the-security-council-the-covid-19-pandemic-delivered

17 In the latest development, Germany and Estonia submitted a new draft resolution in the Security Council on May 12, but eventually no resolution was adopted.

18 UN Doc. RES A/74/L.52, 2 April 2020, available at https://www.un.org/pga/74/wp-content/uploads/sites/99/2020/03/A-74-L.52.pdf

19 Press Release, 13 February 2020, available at https://www.peaceau.org/uploads/psc.-910.press-statement.ebola-coronavirus.13.02.2020.pdf.

20 For the full text of the resolution see http://www.peaceau.org/en/article/communique-of-the-915th-psc-meeting-on-the-situation-in-the-novel-coronavirus-disease-covid-19-outbreak

1. A brief overview of threats actually qualified as CBRN events and the actors involved therein

In order to make a preliminary assessment in terms of definitions with a view to better focus and adjourn our research agenda, it is useful to give a few detailed examples and identify a set of cases as precedents and/or as possible case-studies[21].

2.1. Chemical threats/agents and relevant actors

Chemical threats/events include the weaponization of various kinds of gas and their use during armed conflicts and/or their use by non-state/terrorist actors also in times of peace.

Notwithstanding norms defining and prohibiting the use of chemical weapons, most recently various types of chemical weapons and delivery methods have been used, as widely reported, on a large scale in the Syrian conflict by both State and non-state actors, just to give a relevant example. As it is well known, the UN Security Council was unable to adopt adequate measures to respond to the use of chemical weapons. The lead was taken by the Organization for the Prohibition of Chemical Weapons (OPCW) that has been actively involved in Syria since 2013, after the country accession to the Chemical Weapons Convention (CWC), through various investigating missions. As far as definitions of chemical agents and weapons and tools to address the ensuing threats, indeed the CWC and the OPWC are amongst the most relevant actors to be taken into account. As assessment in this respect is included in our research agenda and will contribute to highlight existing weaknesses and lacunas and most relevant challenges to be considered, including the threat of environmental damages.

Chemical weapons may also be used in terrorist attacks causing small or large-scale casualties and spreading panic. Relevant examples include cases dating back to the 1990s. For instance, the use of gas sarin in Japan in June 1994 and in March 1995 caused great shock and dramatically showed how chemical agents could be employed against helpless citizens. A Japanese terrorist group, Aum Shinrikyo, released sarin first in Matsumoto, on 27 June 2014. About 600 people were exposed, seven persons living close to the sarin release died. On 20 March 1995, Aum Shinrikyo launched a coordinated attack using sarin on the Tokyo subway system. Over 5000 people were affected: 984 were moderately poisoned, 54 were severely poisoned and 12 died.[22]

[21] See the short memos constantly updated on the website of the project.

[22] R Gunaratna, 'Aum Shinrikyo's Rise, Fall and Revival', (2018) 10 *Counter Terrorist Trends and Analyses*, 1-6.

A couple of years later, in 1997, the CWC entered into force. Over the years, terrorist networks as Al-Qaeda and ISIL - besides their involvement in armed conflicts and their use of chemical weapons in that context - were suspected of planning chemical attacks in European cities.[23] It is precisely in this area of terrorism threats that express references to CBRN events occur more frequently.[24] In light of current events, in mapping relevant international obligations, it is worth to verify whether the strategies developed mainly in a counter-terrorism perspective could be adapted to other scenarios and whereas there are already attempts both at the domestic level and by international organizations in that direction.[25]

Cases where complex chemical agents were used to carry out assassinations or assassination attempts could be included in the list of case-studies. The VX nerve agent was used to kill North Korean leader Kim Jong Un's half-brother, Kim Jong Nam, at the Kuala Lumpur International Airport in Malaysia in 2017[26]. Toxic chemical agents were used in the UK in 2018 in attacks against three individuals, Mr Sergej Skripal, Ms Yulia Skripal, and Mr Nicholas Bailey[27]. The implications for such kind use could extend beyond the direct victims: the use of toxic chemicals in public spaces could potentially affect a large number of victims.

Chemical threats/events may also include the accidental release of toxic agents from a chemical plant or a pipeline. The most serious chemical accident ever recorded is the 1984 Bhopal disaster occurred in 1984 in India, where more than 3,000 people died after a highly toxic gas (methyl isocyanate) was released from a Union Carbide Pesticides Factory[28]. Very serious industrial accident had occurred already in Europe, such as the Flixborough accident[29] and the Seveso disaster in 1976[30], which gave rise among other things to the well known Seveso II Directive. In this area, the role of private actors is to be broadly investigated.

[23] Just to give an example D Bamber, C Hastings, and Rajeev Syal, 'Bin Laden British Cell Planned Gas Attack on European Parliament', *The Daily Telegraph (London)*, 16 September 2001.

[24] See S. Venier, 'CBRN emergency management cycle: working definitions'(Working Paper, May 2020) and 'CBRN emergency management cycle: background considerations'(Working Paper, May 2020).

[25] See for instance the EU shift towards an all-hazard approach, L. Magi, D. Mauri, D. Russo, L.Vierucci, 'CBRN 'agents', 'events' and 'actors': in search of working definitions? (Working paper June 2020).

[26] Reuters, *Chemical weapon VX nerve agent killed North Korean leader's half brother*, available at https://www.reuters.com/article/us-northkorea-malaysia-kim/chemical-weapon-vx-nerve-agent-killed-north-korean-leaders-half-brother-malaysian-police-idUSKBN16303Z. See T Nakagawa; A T. Tu, 'Murders with VX: Aum Shinrikyo in Japan and the assassination of Kim Jong‑Nam in Malaysia', in (2018) 36 *Forensic Toxicology*, 542.

[27] UN Press release, 14 March 2018, available at https://www.un.org/press/en/2018/sc13247.doc.htm.

[28] Indian officials estimate that the gas leak left nearly 3000 people dead and 50,000 people permanently disabled and that 15,000 people died subsequently from exposure to the poisonous gas. (Unofficial estimates range up to 7000-8000 initial deaths, and 15,000-20,000 subsequent deaths.), see https://www.business-humanrights.org/en/union-carbidedow-lawsuit-re-bhopal.

[29] M Dunton, 'Flixborough,1 June 1974', *The National Archives, Records and Research*, 20 May 2014, available at https://blog.nationalarchives.gov.uk/flixborough-1-june-1974/.

[30] B De Marchi, S Funtowicz, and J Ravetz, 'Seveso: A paradoxical classic disaster', in J K Mitchell (ed.), *The long road discovery: Community responses to industrial disasters* (UNU Press 1996) available at http://archive.unu.edu/unupress/unupbooks/uu21le/uu21le09.htm. See the Memo "The Seveso Affair".

2.2. Biological threats/events and relevant actors

Biological threats may include the use, for instance, of Bacillus anthracis, Clostridium botulinum, and other biological agents for attacks in the context of armed conflicts or terrorist acts, but also naturally generated incidents, including pandemic outbreaks of infectious diseases such as new strains of corona viruses as the one we are currently fighting.

In the first place, biological agents may be weaponized in a variety of different manners; they may be used as weapons delivered through bombs and missiles, but also indirectly through the contamination of water and food. History is full of attempts at using diseases in biological warfare; biological weapons have been used recurrently for nearly 2,500 years[31]. The techniques of delivery and weaponization of biological agents evolved from the catapulting dead bodies of plague victims to the deliberate use of infected clothes, the contamination of wells, insect vectors, and specialized weapon systems. In 1915, the first State program for biological warfare was started by Germany - for the first time relying on a scientific understanding of diseases - [32] featuring covert operations with the objective to infect livestock and contaminate animal feed to be exported to Allied forces.[33] Some legal experts contended that the use of biological weapons was already prohibited under customary international law during World War I, while others argued that it was banned by the prohibition against the use of poisons in the 1907 Hague Convention. The 1925 Geneva Protocol was the first explicit ban on the use of biological agents as weapons of war.[34]

Notwithstanding the ban, several countries began, during World War II, biological warfare research programs. The most relevant one was the Japanese program, led by the notorious as "Unit 731" and was located in Manchuria and lasting from 1932 to 1945[35]. More than 10,000 prisoners are believed to have died as a result of experimental infection during the Japanese

[31] Eitzen EM Jr, Takafuji ET, 'Historical overview of biological warfare', in Sidell, Takafuji, Franz (eds.) *Medical Aspects of Chemical and Biological Warfare* (Borden Institute, Walter Reed Army Medical Center, 1997), 415–423, available at http:/www.bordeninstitute.army.mil/cwbw/default_index.htm

[32] See M L Wheelis, 'Biological Sabotage in World War I', in E Geissler, J van Courtland Moon (eds.), *Biological and Toxin Weapons: Research, Development, and Use from the Middle Ages to 1945* (OUP 1999), at 35.

[33] 'Bacillus anthracis and Burkholderia (Pseudomonas) mallei, the etiologic agents of anthrax and glanders, were to be used to infect Romanian sheep for export to Russia. Cultures confiscated from the German Legation in Romania in 1916 were identified as anthracis and mallei, at the Bucharest Institute of Bacteriology and Pathology. Burkholderia mallei was allegedly used by German saboteurs operating in Mesopotamia to inoculate 4500 mules and in France to infect horses of the French cavalry. Argentinian livestock intended for export to Allied forces were infected with anthracis and mallei, resulting in the deaths of more than 200 mules from 1917 to 1918. Operations in the United States included attempts to contaminate animal feed and to infect horses intended for export during World War I.', G W Christopher, T J. Cieslak; J A. Pavlin, E M. Eitzen, 'Biological warfare: A Historical Perspective' (1997) 14 JAMA, 364.

[34] J R. Walker, 'The 1925 Geneva Protocol: Export Controls, Britain, Poland and Why the Protocol Came to Include "Bacteriological" Warfare', *Harvard Sussex Program Occasional Paper* 05 (2016).

[35] P Williams, D Wallace, *Unit 731: Japan's Secret Biological Warfare in World War II* (Free Press 1989).

program. At least 3000 of these victims were prisoners of war, including Korean, Chinese, Mongolian, Soviet, American, British, and Australian soldiers[36]. There is also evidence of attacks with biological weapons on Chinese cities.[37] After the Word War II, all major States developed biological warfare programs and there are scholarly attempts at identifying cases of State use of these weapons.[38] An additional challenge, with respect to chemical weapons, lies in the difficulty of differentiating between a naturally occurring epidemic and an alleged or attempted biological warfare attack, both in the past and in present times.

The US and the USSR developed technologies methods for the effective and efficient aerosol dissemination of biological agents, with the potential of inflicting mass casualties. For most states the supporting evidence is weak or even nonexistent. Negotiations to prohibit biological weapons became part of the agenda of the international community with the organization of the United Nations. The result was the 1972 Biological weapons convention (BWC), which prohibited possession of any biological and toxin weapons[39]. Although the treaty does not define what constitutes a biological weapon, subsequent deliberations made clear that the agreement proscribes the possession of any weapon that incorporates any pathogenic microorganism or poison of biological origin, including those developed using science that did not exist at the time the treaty was negotiated. The major weakness of the BWC Convention is the lack of a monitoring mechanism, that some argue could have been of help in the current situation. However, it has been contended that, notwithstanding this point of weakness, the BWC could complement the International health regulations legal framework for global disease surveillance;[40] it may be worth exploring this possibility and including this dimension in our research agenda.

Besides the use of biological weapons by States both in armed conflicts and outside that context, also the issue of bioterrorism emerged. A relevant case is the attack brought a cult group,

[36] S Harris, 'The Japanese biological warfare programme', in E Geissler, J van Courtland Moon (eds.), op.cit.,127.

[37] During the war, the Japanese army poisoned more than 1,000 water wells in Chinese villages to study cholera and typhus outbreaks. Japanese planes dropped plague-infested fleas over Chinese cities or distributed them by means of saboteurs in rice fields and along roads. Some of the epidemics they caused persisted for years and continued to kill more than 30,000 people in 1947, long after the Japanese had surrendered, *ibidem*. See also W. Carus, 'The History of Biological Weapons Use: What We Know and What We Don't', (2015) 13 *Health Security*, 236-237.

[38] *Ibidem.*

[39] There was an inherent limitation in the 1925 Geneva Protocol since it only prohibited bacteriological 'methods of warfare' and not the 'means' and id did not contain a definition of prohibited methods. See Baxter; Buerghental, 'Legal Aspects of the Geneva Protocol of 1925', AJIL 1970, p. 853.See L Vierucci, 'Offensive Military Applications of Biotechnologies. Loopholes in the Law?', in F. Francioni (ed), *Biotechnologies and International Human Rights* (Hart 2007), 363.

[40] Olha Bozhenko, 'Deweaponising the Biological Weapons Convention: Can an arms control instrument enhance the global disease surveillance?'in *EJILtalk!*, 20 February 2020,at https://www.ejiltalk.org/deweaponising-the-biological-weapons-convention-can-an-arms-control-instrument-enhance-the-global-disease-surveillance/.

the Rajneeshees, in 1984 in town of The Dalles, Oregon. The attempt was carried out by contaminating food at restaurants with *Salmonella typhimurium*, in order to prevent voters to cast their ballots on the election day. These attacks ultimately caused 751 people to become ill, including many who had to be hospitalized.[41]

Al Qaeda allegedly started a biological weapons program in the late 1990s, with the construction of a laboratory in Afghanistan, but there is no evidence that it ever acquired any biological agents. In any case, these activities were disrupted by the US Operation Enduring Freedom and the program was never put back together.[42] Other radical jihadist groups also expressed interest in BW but eventually focus on capabilities easier to acquire such as chemical weapons[43]. Another relevant example of a bioterrorism event is the anthrax letter attacks that occurred in the US in September and October 2001. The letters targeted three news outlets and two U.S. Senators. Five Americans were killed and 17 were sickened. The ensuing investigation by the FBI and its partners—code-named 'Amerithrax'— ultimately identified the perpetrator of the attacks as Bruce Ivins, an anthrax expert at the U.S. Army Research Institute of Infectious Disease. Our research agenda is already taking into account the issue of the CBRN (including biological) events and the reaction developed in the various phases.

On the other hand, we are witnessing that serious infectious diseases can spread on a worldwide basis with very little notice and a very serious detrimental and lasting effects on health and societies. The category of *Global catastrophic biological risk* (GCBR) defines risks involving biological agents—whether naturally emerging or reemerging, deliberately created and released, or laboratory-engineered and escaped—that could lead to sudden, extraordinary, widespread disaster beyond the collective capability of national and international organizations and the private sector to control.[44] While the risks of severe pandemics and GCBR events may be rare, they may be increasing due to several factors like population growth and urbanization, climate change and not least the availability of rapid and affordable means of travel.

[41] W R Clark, 'Bioterrorism Beginnings: The Rajneesh Cult, Oregon, 1985', in OUP Blog, 5 October 2009, at https://blog.oup.com/2009/10/bioterrorism-beginnings/.

[42] M Leitenberg, *Assessing the Biological Weapons and Bioterrorism Threat* (University of Michigan 2005*);* R Mowatt- Larssen, *'Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality?'* (2010) *Belfer Center for Science and International Affairs, Harvard Kennedy School, 2010*, available at https://www.belfercenter.org/sites/default/files/legacy/files/al-qaeda-wmd-threat.pdf

[43] S Hummel, 'The Islamic State and WMD: Assessing the Future Threat', *CTC Sentinel* 9, no. 1 (January 2016), 18–22.

[44] *Global Biological Catastrophic Risks* (GCBRs) are biological risks of unprecedented scale that have the potential to cause such significant damage to human civilization that they undermine its long-term potential. Uncontrolled, the impact of a global biological catastrophic event would cause tremendous loss of life; societal instability; prolonged damage to governments and economies, damage to international relationships; and would threaten global security, see the *Nuclear threat Initiative website* at https://www.nti.org/about/projects/global-catastrophic-biological-risks/. See E Cameron, 'Emerging and Converging Global Catastrophic Biological Risks' (2017) 15 *Health security*, 337.

Actually, when comparing the hypothetical nature of intentional attacks with biological weapons/agents with the death toll of the current pandemic (and with numbers of victims dying each year from preventable infections), one might wonder how many resources and efforts States and IOs can reasonably allocate to be prepared for a remote and speculative human-inflicted disaster instead of investing on the management of GCBR events.

2.3 Radio-nuclear threats/events and relevant actors

As already stressed for chemical and biological agents, events caused by the use of radio-nuclear agents may be in the first place caused by their weaponization and their potential use in the context of armed conflicts and/or in the context of terrorist attacks.

An example of a radiological threat is the use of radiological dispersal devices (RDDs also called dirty bombs) that disperse radioactive substances used for medical or industrial applications, which are relatively easy to obtain, by attaching them to explosive devices[45]. On the other hand, clear examples of nuclear threats are attacks by nuclear explosive devices assembled as weapons. A nuclear weapon relies on a nuclear-fission reaction to generate an extremely powerful explosive blast. The efforts to negotiate a radiological weapons convention failed, whereas as far as nuclear weapons and threats are concerned a long series of treaties aiming at heading towards nuclear disarmament and nuclear testing. Here as well, States, IOs and non-state actors such as armed groups or terrorist movements are to be taken into consideration in terms of mapping existing obligations and with respect to all the phases of the management cycle.

Radio-Nuclear accidents may range from isolated cases of accidental contamination or over-exposure of a few persons (for instance medical professionals) to major catastrophes with global dimensions, like the Chernobyl of Fukushima ones. The radio-nuclear waste disposal is also suitable of causing a CBRN event. In this perspective, the role of private actors such as multinational enterprises is to be investigated.

In 1990 the IAEA and the Nuclear Energy Agency of the Organization for Economic Co-operation and Development (OECD/NEA) developed a scale of gravity: International Nuclear

[45] A radioactive “dirty bomb” or radiological dispersal device (RDD), made by combining radioactive material with conventional explosives to spread it, would not cause catastrophic levels of death and injury on the scale of a nuclear weapon detonation. A dirty bomb explosion could cause significant short-and long-term health problems for those in the area and could leave billions of dollars in damage due to the costs of evacuation, relocation and cleanup. Buildings would have to be demolished and debris removed. Access to a contaminated area could be limited for years, as a site is cleaned well enough to meet environmental standards for protecting the public against harmful gamma rays that could penetrate human skin and potentially cause cellular damage.

and Radiological Event Scale (INES). The scale was originally intended to classify events at nuclear power plants, but gradually extended to be applied to events occurring at all installations associated with the civil nuclear industry. It has later been extended and adapted to indicate the gravity of all events associated with the use, storage and transport of radioactive material and radiation sources[46]. There are already several attempts at drawing complete lists of radio-nuclear events. [47]

Besides mapping existing international obligations, it might be interesting to investigate the efforts put in place by the IACRNE (Inter-Agency Committee on Radiological and Nuclear Emergencies): a network of international organizations, where International Atomic Energy Agency (IAEA) is the prime coordinating agency, established to ensure continuous communication prior to, during, and after emergencies.[48]. For instance, also the International Health Regulations (2005) include in their scope radio-nuclear hazards and countries should meet the core national capacities requirements for response to radiation emergencies. What can we learn from this scenario in terms of facing other kind of events such as a disease outbreak?

2. Concluding remarks or preliminary research questions?

A few basic questions emerge from a very preliminary and non-exhaustive overview of CBRN events. To what extent the CBRN concept/paradigm may be precisely identified and translated into a working definition for the purposes of our research? Is it still up to date or is it gradually moving into the background to leave room to other notions such as GRAF or GBCR? It may be worth to investigate, in the various phases of our research, in which contexts the concept

[46] The International Nuclear and Radiological Event Scale (INES) is a tool for communicating the safety significance of nuclear and radiological events to the public. Member States use INES on a voluntary basis to rate and communicate events that occur within their territory. It is not a notification or reporting system to be used in emergency response, see https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale

[47] See for instance the lists of relevants incidents available respectively at http://www.johnstonsarchive.net/nuclear/radevents/index.html and in the database of *The Guardian* at https://www.theguardian.com/news/datablog/2011/mar/14/nuclear-power-plant-accidents-list-rank#data

[48] The network include the following organizations Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) Euro-Atlantic Disaster Response Coordination Centre (EADRCC) European Commission (EC) European Police Office (EUROPOL) Food and Agriculture Organization of the United Nations (FAO) International Atomic Energy Agency (IAEA) International Civil Aviation Organization (ICAO) International Labour Organization (ILO) International Maritime Organization (IMO) INTERPOL Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD NEA) Pan American Health Organization (PAHO) United Nations Development Programme (UNDP) United Nations Environment Programme (UNEP) United Nations Office for the Coordination of Humanitarian Affairs (OCHA) United Nations Office for Outer Space Affairs (OOSA) World Health Organization (WHO) World Meteorological Organization (WMO) In cooperation with the: International Federation of Red Cross and Red Crescent Societies (IFRC) United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).

of CBRN events has been gradually enlarged to embrace an all-hazards approach (for instance in IOs documents) and in which areas it was instead never adopted as an appropriate label (disaster law or health regulations). It may also be worth investigating whether strategies and answers explicitly developed to respond to CBRN events in a security or counter-terrorism perspective may be useful to deal with other emergencies such as natural disasters or pandemic outbreaks. As COVID-19 found the international community largely unprepared, it seems important not to act as the proverbial generals fighting the last war by preparing responses applicable only to the threats of yesterday.