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Protecting the European homeland

The CBR dimension

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Preface

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A chemical or biological terrorist attack against any European city has become an 'unthinkable' scenario that can no longer be ignored. The European Security Strategy, adopted at the European Council in December 2003, stressed that 'the most frightening scenario is one in which terrorist groups acquire weapons of mass destruction. In this event, a small group would be able to inflict damage on a scale previously possible only for States and armies'. Following the terrorist attack in Madrid in March 2004, the EU decided to appoint a EU counter-terrorism Coordinator while adopting, well before the Constitutional Treaty, a solidarity clause in the event of a terrorist attack against one of the member states of the Union. In June 2004, the European Council added to its priorities the necessity to prevent and cope with the consequences of any type of terrorist attack, to enhance cooperation on civil protection and to prepare an overall strategy for the protection of critical infrastructures.

But the dilemmas encountered in dealing with unconventional terrorism are well known. First, the most catastrophic scenario is also the most unlikely, even though its probability has been increasing over time. Second, it is very difficult to prepare the public and increase public awareness of the threat without creating counter-productive effects of panic, which is precisely one of the aims of any terrorist organisation. Third, it is even more difficult to convince national parliaments to sustain, over a long period of time, serious and increased budgetary efforts to counter a threat that may never become a reality, at a time when security and defence budgets are already overstretched in most European countries. Fourth, these catastrophic scenarios are also the ones where the need to articulate national sovereignty and European competencies – and, within the EU, the Commission and Council's prerogatives – becomes highly challenging.

As the EU is trying to implement a comprehensive concept of security – linking the traditional definitions of internal and external security and defence – the Institute has decided to complement its ESDP dimension by a new research programme devoted to protection *against terrorism in Europe. Gustav Lindstrom, a research fellow at the Institute, has been responsible for this project: this* Chaillot Paper *constitutes the first comprehensive study on the threat of CBR terrorism to Europe and a systematic review of measures and policies already implemented. On the basis of this assessment, this paper is also a strong plea for implementation, at the EU level, of a 'Common Homeland Security Policy'.*

Introduction

The Sarin attacks carried out by the Japanese cult Aum Shinrikyo in Matsumoto (1994) and Tokyo (1995) highlighted the threat posed by non-state actors equipped with non-conventional weapons. While the number of casualties was limited, the attack signalled a cause for concern.

In 2001, the United States was struck by bio-terrorism a few days after the 11 September attacks. Weapons-grade anthrax was distributed by postal mail, killing five people, making 17 others ill, forcing policy-makers to evacuate Capitol Hill, shutting down postal delivery and damaging the economy. An already shocked nation discovered it was vulnerable to a new kind of threat. In the aftermath of these attacks, the question is when and where it will happen again.

While the probability of a chemical, biological or radiological (CBR) attack on the European continent is low, the ramifications of such an attack could be high. Recent arrests in countries such as the United Kingdom and France suggest that the likelihood of a CBR attack may be increasing over time.[1] Although Europe is taking steps to prepare against these types of threats, there is substantial room for improvement.

The purpose of this *Chaillot Paper* is to analyse EU-wide activities in the area of chemical, biological or radiological protection. The focus is on policies and preparations to deal with the aftermath of a CBR event. Since CBR response is primarily handled at the national level through its first responders, consideration is also given to national measures and polices. Throughout this text, CBR terrorism is defined as the use or threat of use of chemical, biological or radiological agents to harm people, livestock, infrastructure or the environment.[2]

1. For more on probabilities of a CBR attack see chapter four in Eric Larson and John E. Peters, *Preparing the U.S. Army for Homeland Security: Concepts, Issues, and Options* (Santa Monica, Calif.: RAND, 2001).

2. This definition is a slightly modified version of the definition of biological and chemical terrorism provided by George Gouvras, 'Bioterrorism: the Scourge of the 21st Century?', presentation by the European Commission Task Force on Health Security, 30 October 2002; http://europa.eu.int/ comm/health/ph_threats/Bioterrorisme/bioterrorism_30_10_2002_en.pdf.

Organisation of the report

The first chapter of this report gauges the CBR threat, analysing why the threat is more relevant today. Chapter two examines CBR agents and their potential effects. Chapter three analyses the response mechanisms available at the EU level. Chapter four considers the organisation of civil protection at the individual EU member state level. Finally, chapter five offers key conclusions drawn from the preceding chapters, accompanied by policy recommendations. No classified information was used to produce this report. In addition, the report follows the precedent set by other publications in the field by not providing detailed accounts of agent production, storage, and dissemination methods.

In addition to highlighting the focus of the report, it is equally important to point out what it does not address. It does not consider the nuclear dimension that is usually added to the abbreviation CBR (CBRN). A separate publication would be needed to properly address the issues arising from the nuclear threat, so it is not tackled here.[3] In addition, the report does not delve too far into the policies and measures aiming to deter the spread and use of CBR agents. Those interested in this particular aspect are referred to a recent EUISS publication in this area.[4]

3. Nor does it consider the 'high-yield explosives' dimension which is increasingly raised in conjunction with these weapons. For an overview of nuclear weapons and their potential use see Alexander Kelle and Annette Schaper, 'Terrorism using biological and nuclear weapons: a critical analysis of risks after 11 September 2001', *Peace Research Institute Report* no. 64, Frankfurt, 2002. See also the results of the May 2004 WMD simulation organised by CSIS.

4. Gustav Lindstrom and Burkard Schmitt (eds.), 'Fighting proliferation – European perspectives', *Chaillot Paper* 66 (Paris: EU Institute for Security Studies, December 2003).

Gauging the CBR threat

It is relatively easy to dismiss the threat of chemical, biological, or radiological attacks from a historical perspective. While chemical and biological agents have been used during times of conflict for hundreds of years, there have been few instances in recent decades. Excluding the use of chemical agents by state actors in the Iran-Iraq war (1980-88) and by Iraq against the Kurds in Halabja (1988), the scope of such attacks over the last few years has been limited. CBR-related deaths since the early 1990s as a result of terrorist attacks are estimated to be in the mid-twenties.[5] This figure is small compared with figures resulting from international terrorism (625 deaths in 2003, 725 deaths in 2002).[6] If we take into account both domestic and international terrorism, there were 1,165 incidents worldwide in 2003, resulting in 1,133 fatalities.[7] In turn, these figures pale in comparison with the number of people affected by other global threats. For example, according to the World Health Organisation, over 14 million people die each year from preventable infectious diseases. Thus, when CBR-related deaths are put in perspective, there seems to be minimal cause for concern. What, then, is it about potential CBR attacks that warrants our attention?

A number of non-state actors have shown interest in acquiring CBR agents

According to the US Defense Department, there are over two dozen states or non-state groups that either have, or have an interest in acquiring, chemical weapons. With respect to biological warfare programmes, a number of terrorist groups, including al-Qaeda, have shown their interest in acquiring these types of weapons.[8] According to a Central Intelligence Agency (CIA) report to Congress in late 2002, al-Qaeda's efforts to obtain biological warfare knowledge was more advanced than previously thought.[9]

5. This number includes the figures for the Matsumoto and Tokyo Sarin attacks as well as the 2001 anthrax attack in the United States.

6. *Patterns of Global Terrorism*, US State Department, April 2004 (revised version 22 June 2004).

7. The Terrorism Knowledge Base, the National Memorial Institute for the Prevention of Terrorism (MIPT), 14 June 2004. The figures from MIPT are higher than those of the State Department because they include both international and domestic terrorist incidents. For 2002, MIPT recorded 2,635 terrorist incidents resulting in 2,707 fatalities.

8. *Annual Report to Congress (vol. 1)*, Chemical and Biological Defense Program, Department of Defense, April, 2003, p. v.

9. Verena Wohlleben, (general rapporteur), 'Civil Protection, a General Overview', NATO Parliamentary Assembly, 143 CC 03 rev.1, 8 November 2003.

CBR agents may be increasingly easy to develop

Traditionally, CBR weapons have been accessible only to state actors. Their monopolistic position has been guaranteed through technical, financial and logistical hurdles associated with the production, maintenance and dissemination of such agents. With the passage of time, these ‘barriers to entry’ are gradually dissipating, reaching the point were CBR agents are increasingly accessible to non-state actors. Advances in dual-use technologies may likewise reduce the technical barriers associated with the production of chemical or biological agents. While there is disagreement among experts and scientists on the ease of use of serviceable CBR agents, several believe that they are within reach of both groups and individuals.[10]

Disagreements over the ease of use of CBR agents can be traced to the different phases required for the production of serviceable CBR weapons: development, storage and dissemination. Achieving each stage requires specific knowledge and skills. With information on the production stage increasingly available, certain analysts argue that production is easier today than a few years ago.

For example, information on CB weapons is readily available through the Internet, through publicly available scientific literature and through scientific conferences. In July 2002, a group of scientists were able to create a polio virus using segments of DNA ordered by mail and genetic information publicly available on the Internet. The synthetic virus was effective when injected into animals – demonstrating the potential for carrying out agro-terrorism.[11] In 2003, a sting operation by the US General Accounting Office found that individuals and companies could easily purchase the precursor materials needed to produce certain biological weapons through the Defense Department’s surplus material sales.[12] Production techniques for many chemical weapons, including patent and chemical publications, have also been published in the open literature. With respect to radiological threats, the materials needed to make ‘dirty’ bombs are theoretically within reach. Hospitals regularly cache or dispose of radioactive material, as do many other institutions using such materials.

Others counter that other stages, such as the dissemination stage, still require specialised tools and know-how that are not widely known, making serviceable CBR agents a difficult objective to reach. The need to ensure adequate storage further complicates

10. See for example ibid., p. 2. See also Dana Shea and Frank Gottron, *Small-scale Terrorist Attacks using Chemical and Biological Agents: an Assessment Framework and Preliminary Comparisons*, CRS Report for Congress, RL32391, 20 May 2004.

11. Sylvia P. Westphal, ‘Ebola virus could be synthesised’, *New Scientist*, 20 July 2002, p. 7; http://www.newscientist.com/news/news.jsp?id=ns99992555.

12. Julian Borger, ‘Pentagon offers “bioterror kit” online’, *The Guardian*, 8 October 2003; http://www.guardian.co.uk/international/story/0,3604,1058221,00.html.

the task of maintaining CBR agents. In the case of biological agents, the micro-organisms require specific protection against the elements, which can lead to desiccation, humidity and oxidation.[13] In the case of radioactive materials, the handling and storage process to avoid accidental exposure may be complex.

The case of Aum Shinrikyo is instructive in highlighting the challenges faced by non-state efforts at producing serviceable CBR weapons. The cult experimented with botulin toxin, anthrax, cholera and Q-fever.[14] Attack attempts using botulin toxin and anthrax were not successful because they overcooked certain bioagents, did not have the right technological facilities and did not know how to use the agents effectively.[15] While the sect did not manage to produce or acquire toxic strains of botulism and anthrax, they were able to create enough sarin-producing capacity to kill an estimated 4.2 million people.[16] However, their potential for causing massive casualties was curtailed by rudimentary dissemination capability.

Despite disagreements over producing serviceable CBR agents, it is likely that many of the challenges faced today will be overcome over time.

Terrorists can use conventional weapons against CBR sources

Terrorists may use a hybrid strategy relying on conventional agents – such as explosives – against unconventional targets such as chemical plants, nuclear facilities or hazardous materials transport vehicles. By doing so, they can achieve results comparable to those of a 'traditional' CBR attack without having to manufacture or acquire CBR agents themselves, thereby substantially lowering costs and risks.

A hybrid attack is attractive to terrorists for a variety of reasons. First, it provides an opportunity to produce substantial casualties using limited resources. Second, there are multiple targets available, ranging from chemical plants in the proximity of urban areas to railway wagons transporting hazardous materials. Third, a hybrid strategy is consistent with the way terrorists operate. Modern terrorists have for decades relied on explosives to carry out their attacks. Among all recorded terrorist incidents since 1998, approximately 60 per cent have involved the use of explosives.[17] The possibility to use such means to produce a CBR-like result makes this type of attack both attractive and attainable.

13. Op. cit. in note 9.

14. Kyle Olson, 'Aum Shinrikyo: Once and Future Threat?'; http://www.cdc.gov/ncidod/EID/vol5no4/olson.htm.

15. Ibid.

16. Shawn Choy, 'In The Spotlight: Aum Shinrikyo', Center for Defense Information, 23 July 2002; http://www.cdi.org/terrorism/AumShinrikyo.cfm.

17. Data from the Terrorism Knowledge Base, the National Memorial Institute for the Prevention of Terrorism (MIPT), 14 June 2004.

CBR attacks can have a devastating psychological impact

Unlike conventional weapons, CBR agents can produce societal disruptions that greatly surpass those stemming from the initial attack. The unknowns surrounding the aftermath of a CBR attack – especially when the dangerous substances employed cannot be rapidly assessed or detected – can easily induce mass panic, mass evacuations or a surge in demand for health services. For example, the anthrax letter attacks in the United States, which resulted in 22 infections and 5 deaths, led to the prescription of prophylactic antibiotics to well over 32,000 persons.[18] In 1947, a single case of smallpox in New York City resulted in the immunisation of 6,350,000 individuals – of which 500,000 were vaccinated in one day.[19]

The ramifications of a CBR event may spread rapidly across borders

With globalisation and modern transportation, the impact of a CBR attack is likely to be felt across borders. Within the EU, open borders among member states connected by high-speed railways, low-cost airlines and modern roads greatly enhance the cross-border spread of such agents – especially biological agents that may take time before manifesting their symptoms. Among neighbouring countries, the effects of a chemical or radiological attack may rapidly cross borders depending on meteorological conditions.

Attempts to organise and use CBR agents have taken place

In recent years, there have been several small-scale attacks using CBR agents. Examples include the salmonella poisoning incident in the United States (Oregon 1984), the sarin attacks in Japan (1994/95), the caesium-137 container partially buried in Moscow's Ismailovsky Park (1995) and the anthrax letters mailed in the United States in 2001. There have also been a number of uncovered plots – several of which were foiled inside the EU. In February 2002, the Italian authorities thwarted a plot by al-Qaeda to poison Rome's water supply with cyanide-based chemicals.[20] In December 2002, French police arrested four individuals suspected of

18. Gary Gately, 'Antibiotics Were Overprescribed Amid Anthrax Scare', *HealthScout/ScoutNews*, 20 March 2003; http://www.healthscout.com/news/113/512335/main.html.

19. Department for Homeland Security; http://www.homeland-security.org/darkwinter/index.cfm.

20. Joshua Sinai, 'Forecasting chemical and biological terrorist warfare', *Jane's ChemBioWeb*, 28 February 2003; http://www.janes.com/security/international_security/news/jcbw/jcbw030228_1_n.shtml.

possessing chemicals that could be used in an attack.[21] In early January, British officials arrested several men after the poison ricin was found in an apartment in North London.[22] In January 2004, French anti-terrorist police detained five people in Lyons – two of them admitted plans to attack specific targets in France using ricin and botulinum bacteria.[23] In April 2004, British anti-terrorist personnel foiled a plot involving the use of osmium tetroxide.[24] The same month, a French counter-terrorism official warned that terrorists plotting to use chemical weapons in Europe had more advanced plans than security services had previously suspected.[25]

Certain CBR agents can produce effects over the long term

The impact of a CBR attack can be long-lasting. Individuals exposed to biological agents can suffer consequences over weeks or months as symptoms manifest themselves. Areas targeted by chemicals or radioactive materials can contaminate a location for years, depending on the spread of the contaminants – effectively shutting down economic and social activity in affected areas. Moreover, CBR agents can be adapted to different targets. They can reach beyond the human population to livestock, water systems, plants, infrastructures, and food products.[26] Thus, their impact is far-reaching and can take unexpected forms.

Effective measures against CBR agents produce positive spillover effects

Measures to prepare against CBR threats can be useful during other types of catastrophic events such as large-scale industrial accidents. While not common, they do occur. Recent examples in the European continent include the AZF factory explosion in France (2001), the Baia Mare chemical spill in Hungary and Romania (2000) and the Enschede firework factory explosion in the Netherlands (2000). The importance of a collective response was underlined in the Netherlands. With over 20 dead and dozens badly burned, the Netherlands could not accommodate all burn victims and had to rely on facilities in other countries, including Germany and Denmark, for assistance.

21. John Tagliabue, 'Terror Suspects Found With Chemicals in Paris', *New York Times*, 17 December 2002, Section A, p. 20, col. 4.

22. Warren Hoge, 'British Court Charges 4 Men As Terrorists; Arrests Spread', *New York Times*, 14 January 2002, Section A, p. 13 , col. 6.

23. Joby Warrick, 'An Al Qaeda "Chemist" and the Quest for Ricin', *Washington Post*, 5 May 2004, Section A, p. 1.

24. Brian Ross and Christopher Isham, ' "Very Nasty" Potential Bomb Plot Involved Deadly Chemical', ABC News Exclusive, 4 April 2004; http://abcnews.go.com/sections/WNT/Investigation/poison_bomb_plot_040405-1.html.

25. Mark Husband, 'Terrorist Chemical Threat "worse than suspected" ', *Financial Times*, 11 April 2004.

26. With respect to agro-terrorism, according to the Office International des Epizooties (OIE), there are fifteen class A pathogens which can cause 'very serious and rapid spread, irrespective of national borders, that are of serious socio-economic or public health consequence and that are of major importance in the international trade of animals and animal products'. For a complete listing of A and B pathogens see http://www.oie.int.

Clearly, there are multiple reasons for concern about CBR weapons and the potential for an attack. Although the likelihood of an attack may be low, the potential impact could be considerable. In order to understand the impact, the next section of the report considers the different categories of chemical, biological and radiological agents, and the threats associated with their use as weapons.

Understanding the CBR threat

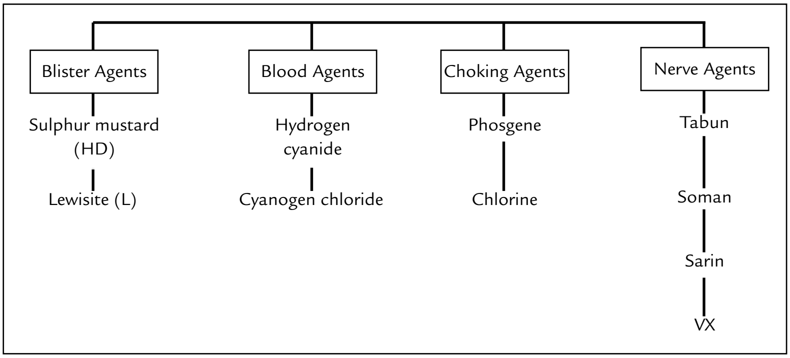
The impact of a CBR event varies according to a number of factors, such as the type and amount of agent used, its dispersion method, meteorological conditions, the target struck and societal reactions to the event. This section provides an overview of different types of CBR agents and their potential effects. In addition to summarising the different characteristics of chemical, biological and radiological materials, it describes detection and response mechanisms.

Chemical weapons

Chemical weapons are non-living, manufactured chemical agents combined with a dispersal mechanism that, when activated, produce incapacitating, damaging or lethal effects on human beings, animals or plants. The chemical agents can be dispersed in four principal forms: as a gas (or vapour), as an aerosol (mist), as solid aerosol (smoke) or as a liquid.[27] Chemical agents generally deliver their effect through inhalation, ingestion, or absorption by the skin. The effects can be lethal or incapacitating and can appear very quickly (in a few seconds) or over the course of a couple of days. Some substances, such as the nerve agent VX, are particularly lethal. The four most frequently cited types of chemical agents are blister, blood (cyanides), choking (pulmonary) and nerve agents. A brief description of each category is provided below.

27. *British Chemical Warfare Defence During the Gulf Conflict*, Annex A. Ministry of Defence; http//: www.mod.uk/issues/gulfwar/info/medical/uk chemical/annexa.htm.

Figure 1: Categories and examples of chemical agents



Source: 'Medical Management of Chemical Casualties Handbook', Chemical Casualty Care Office, US Army Medical Research Institute of Chemical Defense, September 1995, in *Jane's Chemical-Biological Defence Guidebook.*

Blister agents

In August 1998, a chemist was arrested in Moscow after attempting to sell a blister agent (nitrogen mustard) to an undercover police officer. The man synthesized toxic chemicals for sale to criminal buyers, charging his customers $1,500 per vial. Police found chemical equipment, 50 litres of 'strong poisons', 400 millilitres of mustard agent, and a thick notebook containing recipes in his apartment. [28]

Blister agents, also known as vesicants, burn or blister any part of the body with which they come in contact. Particularly sensitive areas are the eyes, mucous membranes, airways, and skin. Blister agents can damage the respiratory tract when inhaled and can cause vomiting and diarrhoea when ingested. While they are not typically lethal, they can result in death at higher doses. Examples of blister agents include sulphur mustard and lewisite (dichloro arsine).

28. 'CW Terrorism Tutorial, Types of CW Agents', A multimedia tutorial produced for The Nuclear Threat Initiative by the Center for Nonproliferation Studies at the Monterey Institute of International Studies; http://www.nti.org/h_learnmore/cwtutorial/chapter04_02.html.

The production of blister agents is within the reach of well-motivated non-state actors with certain financial assets. It is estimated that a sulphur mustard production plant with air-handling capabilities costs between $5 and $10 million to build.[29] To put this figure in context, the CIA estimates that al-Qaeda spent around $30 million each year on expenses including terrorist operations, salaries and maintenance on terrorist training camps prior to Operation *Enduring Freedom*.[30]

Cyanides ('blood agents')

> In February 2002, nine Moroccans were arrested in Rome under suspicion of plotting to attack the US Embassy with cyanide and gunpowder explosive. Authorities seized 10 kilograms of gunpowder, 4.4 kilograms of potassium ferrocyanide and a map detailing plans for the attack. Four of the men arrested had ties to al-Qaeda.[31]

Cyanides work by interfering with the oxygen transfer mechanism between blood and body tissue. Exposure in the case of an attack is most likely to occur through inhalation, although its effects also appear after ingestion. The chemical affects the respiratory system and central nervous system. Inhalation causes confusion, drowsiness, and shortness of breath, leading to collapse and rapid death.[32] Among the better-known cyanides are hydrogen cyanide (AC) and cyanogen chloride (CK). Hydrogen cyanide or 'prussic acid' is a commercially produced substance used both in acrylic resin plastic and other organic chemical production. Cyanogen chloride is also used commercially, albeit in fairly small quantities.

Cyanides tend to be non-persistent, meaning that they will not linger over the exposed environment for a long period. Cyanide-based substances are frequently used for chemical syntheses, electroplating, mineral extraction, dyeing, printing, photography and agriculture. They can also be used for the production of paper, textiles, and plastics. According to one report, almost 300,000 tons of hydrogen cyanide is produced annually by US industry.[33]

29. Office of Technology Assessment, 'Technical Aspects of Chemical Weapon Proliferation', Technologies Underlying Weapons of Mass Destruction, Washington, DC, Government Printing Office, December 1993; pp. 23 and 27 in *Jane's Chemical-Biological Defence Guidebook* (Chapter II), 2000.

30. National Commission on Terrorist Attacks Upon the United States (9/11 Panel) 'Overview of the Enemy', Staff Statement No. 15; http://www.9-11commission.gov/hearings/hearing12/staff_statement_15.pdf.

31. Wayne Turnbull and Praveen Abhayaratne, '2002 WMD Terrorism Chronology: Incidents Involving Sub-National Actors and Chemical, Biological, Radiological, or Nuclear Materials', Monterey Institute for International Studies, Center for Nonproliferation Studies, 2003.

32. 'CW Terrorism Tutorial, CW Agent Primer', a multimedia tutorial produced for The Nuclear Threat Initiative by the Center for Nonproliferation Studies at the Monterey Institute of International Studies; http://www.nti.org/h_learnmore/cwtutorial/multimedia_03_01.html#pagetop.

33. 'Cyanide', Medical Management of Chemical Casualties Handbook at the Federation of American Scientists; http://www.fas.org/nuke/guide/usa/doctrine/army/mmcch/Cyanide.htm.

Pulmonary agents ('choking agents')

> Methyl isocyanate is a chemical used to produce pesticides. Exposure to methyl isocyanate can cause blistering inside the lungs, respiratory tract irritation, nausea and blindness. This was the chemical released in the 1984 Union Carbide accident in Bhopal, India, which killed about 4,000 people and injured approximately 10,000.[34]

Pulmonary agents were used on a large scale during the First World War. They cause severe damage to the bronchial tubes of the lungs as they are inhaled, causing them to fill with fluid. At a high dosage, a victim drowns as lungs fill with water. Examples of pulmonary agents include chlorine and phosgene – both of which are produced commercially around the world.[35] Chlorine is frequently used for the treatment of water and as an ingredient in a number of chemical reactions. Phosgene can be used as a chlorinating agent in organic chemical reactions. Given its highly toxic properties, it is normally produced in a plant where it is subsequently used. Little is offered for sale on the open market. As part of a larger family of toxic industrial chemicals (TICs; see below), these and other agents can be targeted by terrorists in their respective production or storage plants.

Nerve agents

> In March 1995, members of the Japanese cult Aum Shinrikyo released the nerve agent Sarin on Toyko subway trains. The attack killed 12 people and injured over 1,000. Between 1990 and 1995, Aum launched 17 known CBW attacks, of which ten were carried out with chemical weapons and seven attempted attacks were carried out with biological agents. Aum is also alleged to have killed 20 of its dissident members with VX and has been linked more tenuously to more than 19 other CBW attacks and attempted attacks.[36]

Nerve agents incapacitate by blocking nerve pathways between the brain and the voluntary muscles. They can penetrate the skin or be inhaled. Someone exposed to nerve agents at a sufficient dosage

34. 'CW Terrorism Tutorial, Types of CW Agents', a multimedia tutorial produced for The Nuclear Threat Initiative by the Center for Nonproliferation Studies at the Monterey Institute of International Studies; http://www.nti.org/h_learnmore/cwtutorial/chapter03_02.html.

35. Chlorine gas was among the first agents used for chemical warfare during the First World War.

36. 'Chronology of Aum Shinrikyo's CBW Activities', Monterey Institute of International Studies, 2001, p. 1.

will experience muscular spasms and paralysis rapidly. At deadly doses, nerve agents produce respiratory failure through the paralysis.

Nerve agents are frequently categorised into two different types distinguished by their military codenames. The first type is the G-series. It includes tabun (GA), sarin (GB), soman (GD), GE and GF. Nerve agents in this category are unstable and can result in both respiratory and percutaneous effects. The second type, known as the V-series agents include VE, VM, and VX. These substances are less volatile and can be inhaled or penetrate skin. In liquid form, both types of agents show high degrees of persistency.

Generally, the production of nerve agents involves processes that are well within the capabilities of countries with moderately advanced chemical or pharmaceutical industries.[37] Building a sophisticated G-agent production facility might cost between $30 and $50 million. A facility without the waste-handling capacity would lower the price tag to around $20 million.[38]

Existing stores of nerve agents also exist. According to a 2003 GAO report, '[i]t may be 40 years before Russia's nerve agent stockpile can be destroyed. [The US Department of Defense] has improved security at two sites, but two thirds of Russia's stockpile remains vulnerable to theft.'[39]

Toxic industrial chemicals

> Of the 125 chemical attacks reported worldwide between January 1960 and May 2001, household or industrial chemicals were used in the vast majority, in combination with a 'low-tech' delivery method.[40]

Toxic industrial chemicals (TICs), also known as toxic industrial materials (TIMs), do not constitute a separate class of chemicals, but rather those commonly used in industrial production. TICs include arsine, chlorine, ammonia, hydrogen cyanide, phosgene, hydrogen sulphide, acrolein and cyanogen chloride. At certain doses, many of these chemicals can be lethal.[41]

In 1998, NATO's International Task Force-25 (ITF-25) created the TIMs Hazard Index List. It ranks TIMs based on criteria such as the chemicals' production, transport, storage, toxicity and vapour pressure (Table 1). For example, chemicals listed in the

37. For example, tabun (GA) is made from four precursor chemicals: phosphorous oxychloride (POCl3), sodium cyanide, dimethylamine and ethyl alcohol. Ethanol and sodium cyanide are in wide use commercially, while dimethylamine and phosphorous oxychloride are used in the production of pharmaceuticals, pesticides, missile fuels and gasoline additives. These same production methods have also existed for the production of organophosphorus pesticides.

38. Office of Technology Assessment, 'Technical Aspects of Chemical Weapon Proliferation', Technologies Underlying Weapons of Mass Destruction, Washington, DC, Government Printing Office, December 1993, pp. 23, 26-27, in *Jane's Chemical-Biological Defence Guidebook* (Chapter II), 2000.

39. 'Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security at Russian Sites', Washington, DC: U.S. General Accounting Office, 24 March 2003, GAO-03-482.

40. John Tucker, 'Chemical Terrorism: Assessing Threats and Responses', in *High-Impact Terrorism: Proceedings of a Russian-American Workshop* (Washington, DC: National Academies Press, 2002), pp. 122-3.

41. For example, 3,200 milligrams of the choking agent phosgene per cubic metre of air will kill 50 per cent of humans breathing the gas for one minute.

'high hazards' category are widely produced, transported, and stored. They are highly toxic and vaporise easily.[42] To contextualise the dangerous potential of many of these chemicals, methyl isocyanate, which killed a little under 4,000 individuals after its accidental release from a chemical plant in Bhopal, is listed as a medium hazard. The entire list includes roughly one hundred chemicals that can be 'readily found in households and industrial facilities, such as paper mills, waste management facilities, research labs, and plastic manufacturers'.[43]

Table 1: Selected TIMs on the Hazards Index List

High hazard	Medium hazard	Low hazard
Ammonia	Acetone cyanohydrin	Arsenic trichloride
Chlorine	Carbonyl sulphide	Bromine
Fluorine	Chloroacetone	Chlorine trifluoride
Formaldehyde	Ethylene dibromide	Cyanogen chloride
Hydrogen bromide	Methyl bromide	Dimethyl sulphate
Hydrogen cyanide	Methyl isocyanate	Ethyl chloroformate
Nitric acid	Phosphorous oxychloride	Iron pentacarbonyl
Phosgene	Sulphuryl chloride	Isopropyl isocyanate
Sulphur dioxide	Trifluoroacetyl chloride	Nitric oxide

Source: US Department of Justice, *Guide for the Selection of Chemical Agent and Toxic Industrial Material Detection Equipment for Emergency First Responders,* vol. 1 (Washington, DC: GPO, 2000); www.ncjrs.org/pdffiles/nij/184449.pdf, in Mindy Bennett, 'TICs, TIMs, and Terrorists', *Journal of the American Chemical Society*, April 2003.

Detecting chemical agents

Many chemicals are odourless and tasteless, making detection difficult. In many instances, positive identification requires the use of multiple sensors. Examples include oxygen sensors, combustible gas sensors, electrochemical toxic sensors, colorimetric tubes, broadband photo ionisation detectors (PIDs), ion mobility spectrometers (IMS), and gas chromatography/mass spectrometry (GC/MS) systems. In most cases, the most portable and simplistic sensors will only be able to indicate that there may be a certain chemical of concern present. Ensuring positive identification may require bringing samples to more advanced detectors in other locations.

42. Mindy Bennett, 'TICs, TIMs, and Terrorists', *Journal of the American Chemical Society*, April 2003. I thank Dr. Brian Houghton (Director of Research at MIPT) for guiding me to this source.

43. Ibid, p. 21.

Most sensors used for the detection of chemical substances are based on one of three techniques: wave acoustic detection, ion mobility spectroscopy and mass spectroscopy.[44] All three techniques have their advantages and drawbacks. Wave detectors can produce false positive results, IMS may have a difficult time distinguishing between molecules of similar size, and mass spectrometers tend to be bulky and expensive. Other techniques for identifying chemicals, such as gas chromatography, require skilled and trained personnel working in a laboratory setting to produce results. Fortunately, rapid advances are taking place in the field of detection, with emphasis on an 'all-hazards' approach to emergency preparedness. This type of all-hazards approach means that tools, techniques and equipment should be useful for multiple types of situations, including the detection of multiple agents.

Analysis: chemical weapons

Chemical weapons offer attractive possibilities for would-be attackers. Compared to biological and radioactive agents, the materials and equipment needed to produce chemical weapons are easier to acquire and assemble.[45] Besides their availability in large quantities, chemical agents are simpler to handle than radiological or biological substances. Their production techniques are described in the open literature, including patent and chemical publications that provide data on reaction kinetics, catalysts and operating parameters.[46]

While nerve agents are frequently portrayed as the greatest threat, the likelihood of their effective usage is limited. The resources and costs associated with a production facility make it very difficult for a non-state actor to pursue the production of agents such as sarin and soman. There are also risks of detection during the construction process, making them less attractive as an option.[47] Aum Shinrikyo was an exception with its sarin laboratory in Kamikuishiki. In the end, its low-tech dissemination strategy limited the group's potential to create mass casualties. Of greater concern is the fact that many of these nerve agents already exist in large quantities. While such sources are under state control, there is always the possibility that they could be acquired illegally. Among the nerve agents, the V series have the greatest potential for casualties, given their high level of lethality and

44. Wave acoustic detection relies on a thin membrane – usually made of quartz – that vibrates at high frequencies to attract certain chemical substances. The membranes slow down if certain chemicals stick them. Ion mobility spectroscopy adds and subtracts electrons from the chemical molecules being examined so as to charge them electrically. The molecules can then be manoeuvred through the use of an electric field. The molecules can also be evaluated by measuring the speed at which they bounce through a gas. The measurement of the molecule serves as the basis for identification. Mass spectroscopy identifies chemicals by breaking apart molecules and accelerating charged elements towards a magnetic field. The field will bend the paths of the elements, facilitating their identification.

45. Frank Barnaby, *How to Build a Nuclear Bomb and Other Weapons of Mass Destruction* (London: Granta Books, 2003), p. 117.

46. *Jane's Chem-Bio Handbook* (Chapter 2).

47. However, assuming that a state's chemical or biological agent development programme is similar to that of a non-state actor may be misleading. A state programme is likely to have to carry out a number of additional steps. These may include establishing mass-production facilities, stockpiling filled munitions, and acquiring individual/collective defences. See D. Shea and F. Gottron, op. cit. in note 10, pp. 14-15.

persistence. The following table provides an overview of persistency levels of a select number of chemicals:

Table 2: Persistency (in hours and days) of selected liquid chemical agents: varying climatic conditions

Agent	Sunny, light breeze (15°C)	Windy and rainy (10°C)	Sunny, no breeze, snow (-10°C)
Sarin	¼ - 4 hours	¼ - 1 hour	1-2 days
Tabun	1 - 4 days	½ - 6 days	1 - 14 days
Soman	2½ - 5 days	3 - 36 hours	7 - 42 days
Mustard gas*	2 - 7 days	½ - 2 days	14 - 56 days
V agent	3 - 21 days	1 - 12 hours	7 - 112 days

*Mustard gas may persist for 1½ to 4 days at temperatures above 25°C.
Note: besides meteorological conditions such as temperature, windspeed, atmospheric pressure and moisture, persistency is also dependent on conditions on the ground (type of soil, vegetation, etc.).
Source: Swedish National Defence Research Unit (FOA), 'Briefing Book on Chemical Weapons, 1992', in *Jane's Chemical-Biological Defence Guidebook*.

Chemicals that are part of the blood and choking agent families are potentially of greatest concern. Many are well-known TICs characterised by their ubiquity and accessibility – making them both attractive products and targets. A terrorist wishing to take advantage of their availability may choose to target chemical plants containing TICs. Trucks carrying hazardous materials could likewise be targeted or hijacked. Railway wagons transporting chemicals could be sabotaged in a number of different ways with dire consequences to nearby urban areas. The possibilities are many, limited only by imagination and resources. TICs of concern range from the well-known (ammonia and chlorine) to the less known (hydrogen cyanide and phosgene).

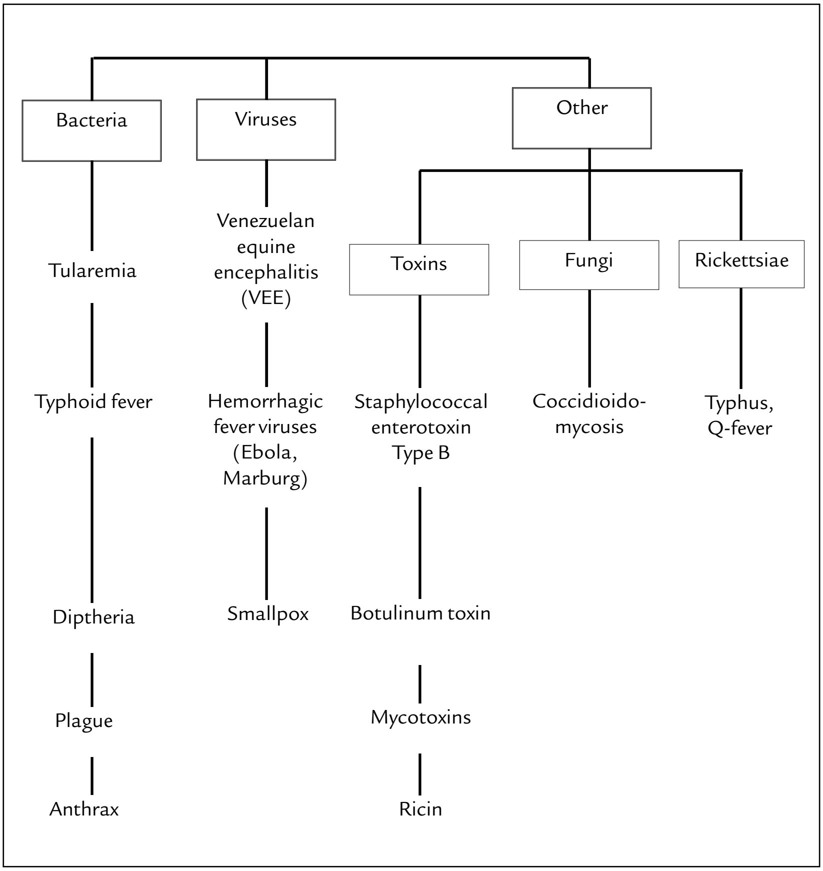
Biological weapons

A biological weapon combines a biological warfare agent with a means of dispersing it.[48] Biological warfare (BW) agents are micro-organisms such as viruses and bacteria that infect humans, livestock or crops and cause an incapacitating or fatal disease. Symptoms of illness appear after a delay, or 'incubation period', that may last from days to weeks. By contrast, toxins – non-living poisons produced by living plants, insects and animals – are difficult to categorise. They fall between chemical and biological agents. Throughout this document they are discussed in the context of biological weapons.

Generally, biological agents are categorised according to one of three forms of micro-organisms: bacteria; viruses; rickettsiae, fungi and toxins. Figure 2 provides examples of the types of diseases associated with each form of micro-organism. Biological agents can enter the human body through the intestines (ingestion), lungs (through inhalation) or skin (cutaneous). The following section provides a brief overview of each category.

48. Dispersal methods can range from advanced aerosol dispersal systems to self-infection (with the purpose of infecting others).

Figure 2: Categories and examples of biological agents



Sources: 'BW Terrorism Tutorial, Biological Agent Primter'. A multimedia tutorial produced the The Nuclear Threat Initiative by the Center for Nonproliferation Studies at the Monterey Institute of International Studies, at http://www.nti.org/h_learnmore/bwtutorial/multimedia_03_02.html; and F. Barnaby, *How to Build a Nuclear Bomb and Other Weapons of Mass Destruction* (London: Granta Books, 2003), p. 42.

Bacteria

> Between June and August 1993, members of the cult Aum Shinrikyo sprayed the vaccine strain of anthrax (bacillus anthracis) at the general population, at the legislature and at the Imperial Palace. All attempts to infect the population were unsuccessful as the cult had not acquired a usable strain of the bacterium.[49]

Bacteria are made up of single cell micro-organisms. Grown in either solid or liquid culture medias, they are differentiated by their staining characteristics and shape. The symptoms caused by bacterial infection can be non-specific. Following an incubation period lasting anywhere from hours (cholera) to about two months (typhoid fever), individuals affected tend to experience symptoms such as fever, headaches, and fatigue. Diseases of concern in this category include anthrax, tularemia, plague, diphtheria and typhoid fever. Fortunately, the diseases caused by bacteria can frequently be treated through antibiotic therapy.

With a mortality rate of about 95 per cent, anthrax represents one of the more worrisome biological threats. It is extremely stable, giving it a high degree of endurance. Spores can last for over forty years. In aerosol form, about 8,000 to 50,000 spores are enough to produce an infective dose. With an incubation period of under a week, anthrax cases are likely to be misdiagnosed, leaving insufficient time for treatment. The initial symptoms are non-specific and could be mistakenly diagnosed as influenza. Treating anthrax infections requires substantial doses of antibiotics such as penicillin, ciprofloxacin, erythromycin or vancomycin.[50] However, in the case of inhalation anthrax, antibiotic treatment is not very effective unless it is begun within a day of exposure. While a vaccine can be used to prevent infection, consideration needs to be given to potential side effects. For example, anthrax vaccinations given to personnel involved in Operation *Desert Storm* are suspected of being one of several factors associated with Gulf War Syndrome. Fortunately, anthrax is extremely unlikely to be transmitted from person to person.

49. 'Chronology of Aum Shinrikyo's CBW Activities', Monterey Institute of International Studies, 2001, p. 2.

50. Op. cit. in note 45.

Viruses

> Between June 22nd-23rd 2001, the United States carried out exercise Dark Winter to simulate the potential effect of a smallpox outbreak. Based on calculations, roughly 3 million smallpox cases were projected a few months after the initial outbreak. With an approximate 30 per cent fatality rate, this equates to about one million fatalities. According to projections, smallpox cases also appeared in several other countries as a result of the initial outbreak.[51]

Viruses are made up of nucleic acid strands covered with casings of protein, and they need a host to grow and reproduce. While the incubation period for viruses tends to be longer than for bacteria, viruses can act rapidly once they have infected the host. Certain diseases caused by viruses – such as smallpox, typhus and rift valley fever – produce telltale signs indicating that something is wrong, including the presence of a rash, blisters or frequent vomiting. Diseases caused by viruses can be treated with limited antiviral compounds but they do not respond to antibiotics.

One virus that has received a lot of attention in recent years is smallpox. Smallpox was eradicated as a natural disease in 1977 through a global vaccination campaign run by the World Health Organisation (WHO). While the last case of the disease occurred in 1978 as the result of a laboratory accident in the United Kingdom, throughout the Cold War the Soviet Union mass-produced smallpox as a weapon for use against US and Chinese cities in the event of a Third World War.[52] Since the mid-1980s, the official stocks of the smallpox virus have been restricted to two WHO-approved repositories in the United States and Russia. While only two official repositories exist, experts are concerned about the possibility of undeclared stocks in Russia, North Korea, and other countries.[53]

Smallpox is particularly troublesome if used as a weapon because (1) it is highly transmissible from person to person; (2) the virus is highly virulent; (3) a large percentage of the population is susceptible to infection; and (4) the psychological impact would be great because it produces a painful and disfiguring rash that leaves permanent scars. Specialists at Johns Hopkins University have argued that even a single case of smallpox might be enough to

51. Final Script, Exercise *Dark Winter*, Johns Hopkins Center for Civilian Biodefense, Center for Strategic and International Studies, ANSER, & Memorial Institute for the Prevention of Terrorism, June 2001; http://www.upmc-biosecurity.org/pages/events/dark_winter/DARK%20WINTER.pdf.

52. 'BW Terrorism Tutorial, Biological Agents of Concern', A multimedia tutorial produced for The Nuclear Threat Initiative by the Center for Nonproliferation Studies at the Monterey Institute of International Studies; http://www.nti.org/h_learnmore/bwtutorial/chapter03_02.html.

53. Ibid.

shut down the entire US air transport system for up to a month to prevent the disease from spreading nationwide. Fortunately, smallpox is difficult for terrorists to obtain because it no longer exists in nature.[54] Concerns linger whether other state actors (besides the United States and Russia) have access to smallpox. Operating under such assumptions, policy-makers cannot dismiss the potential of an inappropriate transfer, whether on purpose or by mistake.

Rickettsiae, fungi and toxins

> In January 2003, six Algerians were arrested in London on charges associated with terrorism. Authorities discovered traces of ricin in their apartment, along with castor oil beans and equipment for crushing the beans. Those arrested are believed to be part of a terrorist cell with possible ties to the millennium bomb plots in the United States. Authorities believe that the ricin discovered was part of a larger batch removed from the apartment before the arrests.[55]

Rickettsiae are micro-organisms that have characteristics common to both bacteria and viruses. Like bacteria, they contain metabolic enzymes, use oxygen and can be treated through a regimen of antibiotics. Like viruses, they grow only within living cells. Symptoms associated with rickettsiae include headaches, fevers, chills, and pains in the joints and muscles. While the majority of rickettsiae are spread through infected insects and are not transmitted from person to person, they could be delivered through an aerosol in the context of a biological attack.[56] The lethality of rickettsiae-induced diseases is fairly limited. For example, Q-fever is lethal in one to two per cent of those who develop acute cases of the disease.[57]

Fungi are organically more complex than bacteria and reproduce through the formation of spores. Fungi tend to draw nutrition from decaying vegetable matter. Most forms of fungi are found around soil. Their symptoms may be hard to distinguish from other common ailments. For example, in the case of coccidioidomycosis, effects are like to include flu-like illness with fever,

54. Ibid.

55. 'Chronology of Incidents Involving Ricin', Monterrey Institute for International Studies, Center for Nonproliferation Studies, 3 February 2004.

56. *Jane's Chemical-Biological Guidebook*, Chapter III.

57. 'Q Fever', U.S. Centers for Disease Control; http://www.cdc.gov/ ncidod/dvrd/qfever/.

cough, headaches, rash and myalgias in approximately 40 per cent of those affected.[58]

Finally, toxins are the by-products of certain micro-organisms, including those of bacteria, fungi, algae, plants, and animals. They can also be produced through genetic engineering. Toxins can enter the body through the lungs, eyes, or broken skin. They can also be delivered using contaminated water or food or through aerolisation. One of the more poisonous toxins is clostridium botulinum, which causes botulism. Other potential toxins of interest include ricin and abrin. Compared to other toxins, both ricin and abrin display low barriers to usage in small-scale attacks.[59] Ricin, made from the by-products left over from processing castor beans, has no known cure. Abrin is similar to ricin but even more toxic. Both can come in the form of a powder, a mist or a pellet.[60] Over the years there have been a number of incidents involving ricin, including ricin powder recently discovered in the mailroom of US Senate majority leader Bill Frist.[61]

Detecting biological agents

The timely detection of dangerous biological agents in individuals is difficult, as those affected often show non-specific symptoms similar to those of the common cold. Misdiagnosis can easily lead to inadequate treatment and end up being more harmful than beneficial. Often, several days or weeks can pass before experts can conclude that an outbreak is occurring. The process can be facilitated or hampered depending on the actions and attitudes of governmental authorities (as was seen in the case with SARS).

With respect to detection in an open environment, real-time detection and measurement are likewise challenging. Many of these challenges are similar to those faced by chemical detectors, which may possibly only detect certain micro-organisms, or are bulky, or are out of financial reach. However, compared with chemical detection devices, biological detection technologies are still catching up. It is only recently that hand-held devices were unveiled for commercial use.[62]

The potential for false positives (detecting the presence of a problematic organism when it is not really there) or false negatives (not detecting a problematic organism when there is one present)

58. 'Coccidioidomycosis', U.S. Centers for Disease Control; http://www.cdc.gov/ncidod/dbmd/diseaseinfo/coccidioidomycosis_t.htm.

59. Dana Shea and Frank Gottron, op. cit. in note 10, p. 12.

60. 'Facts About Abrin', U.S. Centers for Disease Control, http://www.bt.cdc.gov/agent/abrin/basics/facts.asp, and 'Facts About Ricin', U.S. Centers for Disease Control.

61. 'Early tests shows deadly ricin in Senate mailroom', CNN.com, 2 February 2004; http://www.cnn.com/2004/US/02/02/senate.hazardous/.

62. For examples, see http://www.smithsdetection.com (Bio-Seeq system) or http://www.mesosystems.com (BioCapture 550 GSA).

adds an additional layer of complexity. Secondary testing can be used to confirm the identification of a micro-organism, however such a test can take anything from 12 to 48 hours. If biological agents are not detected at this stage, they will most likely go undetected until individuals start experiencing the first symptoms of the disease and decide to go to a doctor.

Analysis: biological weapons

Biological agents may appeal to non-state actors for a variety of reasons. First, the delay between infection and the appearance of symptoms can help maximise the reach of an attack. Second, the potential for contagion may lead to ripple effects without additional action by the attacker. Third, the presence of non-specific symptoms such as those commonly associated with common colds can further magnify the effect of an attack. Fourth, difficulties in detecting an attack and its source may attract individuals or groups who want to remain anonymous. For example, after the Bhagwan Shree Rajneesh sect infected 750 Oregonians with Salmonella in 1984, it took authorities over a year to determine that the infection had been spread intentionally. While terrorists often want to take credit or responsibility for their attack, the possibility for stealth (as was displayed during the 2001 anthrax attack) provides would-be terrorists with the option to remain anonymous or make an announcement at the time of their choosing. Some experts increasingly believe that a terrorist group would not claim responsibility in the aftermath of a chemical or biological attack.[63]

Concerning agent usage, a 2004 CRS report evaluates the 'attractiveness' of several biological agents using six different criteria: ease of acquisition, public health impact, availability of prophylaxis, resistance to medical treatment, ease of dissemination and weaponisation status. While the criteria are not weighted – i.e. all are given equal weight in determining their potential allure to users – the list provides an indication of which agents may be most appealing for use in a small-scale terrorist attack. Table 3 below summarises the information. As seen, viral diseases such as Crimean-Congo hemorrhagic fever and Lassa fever exhibit comparatively lower barriers to usage. Among bacterial diseases, glanders and pneumonic plague display similiar characteristics.

63. 'Countering the Changing Threat of International Terrorism', Report of the National Commission on Terrorism, (Washington DC, 1 August 2000).

Table 3: Barriers to biological agent use in a small-scale terrorist attack

Lower barriers	Medium barriers	Higher barriers
Glanders	Marburg haemorrhagic fever	Venezuelan equine encephalitis
Crimean-Congo Haemorrhagic fever	Ebola haemorrhagic fever	Typhus
Pneumonic plague	Melioidosis	Rocky Mountain spotted fever
Nantavirus	Yellow fever	Escherichia coli 01576:H7
Dengue haemorrhagic fever	Anthrax	Smallpox
Eastern equine encephalitis	Q fever	Monkeypox
Lassa fever	Machupo haemorrhagic fever	Brucellosis
Russian spring-summer encephalitis	Tularemia	Shigella dysenteriae
Western equine encephalitis	Junin haemorrhagic fever	Cholera
Rift Valley fever		Salmonella Typhimurium

Source: Classification based on information presented in Table 2 ('Biological agent comparison according to barriers to potential terrorist use') in D. Shea and F. Gottron, *Small-scale Terrorist Attacks using Chemical and Biological Agents: an Assessment Framework and Preliminary Comparisons*, CRS Report for Congress, RL 32391, 20 May 2004, pp. 24-5.

From a different angle, the production of biological agents at a crude level requires limited scientific knowledge, and certain materials can be readily acquired. For example, personnel attached to laboratories can easily purchase certain strains at the lower level of the danger scale. For example, strains of rickettsiae can be obtained for $500 while the salmonella cholera virus is priced at $150.[64] With respect to production costs, a US government contractor has shown that building a biological weapons manufacturing facility using off-the-shelf technology would cost approximately $1 million.[65]

64. In the United States, until 1997, a domestic researcher could purchase an anthrax culture from a US repository for as little as $45. American Type Culture Collection; http://www.atcc/org.

65. K. Bailey, *The Biological and Toxin Weapons Threat to the United States* (Fairfax, Va.: National Institute for Public Policy,October 2001).

However, the use of biological agents also raises important challenges. As Aum Shinrikyo demonstrated, producing and disseminating biological agents is a complex proposition. Many biological agents require certain conditions to survive (such as limited exposure to heat and sunlight). Some agents, while extremely dangerous and contagious, are not available in nature (smallpox). Others that can be found in nature may have limited potential for contagion, given rapid mortality rates (e.g. Ebola).

Radiological weapons

> In 1996, Chechen rebels placed a container with caesium-137 in a Moscow park. Although the material was not dispersed, it represented a deliberate attempt to employ radiological materials in a terrorist attack.[66]

A radiological dispersal device (RDD), also known as a 'dirty bomb', consists of radioactive material that is packed with conventional explosives. When a RDD is set off, radiation is released into the surrounding air. Thus, beyond the physical impact of the explosion, energy is released in the form of alpha and beta particles, gamma rays and neutrons. While a layer of clothing will stop alpha and beta particles, gamma rays and neutrons require several centimetres of concrete to be blocked. Radioactive material can enter the body through inhalation, ingestion, or through open wounds. Once radioactive material enters the body, internal contamination continues to irradiate the body from within.

The impact of the RDD depends on the amounts of explosives and radioactive material used. Examples of radioactive materials that can be used in an RDD include plutonium, yttrium, caesium, rubidium, thallium and tritium. Finding radiological materials is not impossible. According to the International Atomic Energy Agency (IAEA), '[t]he radioactive materials needed to build a "dirty bomb" can be found in almost any country in the world, and more than 100 countries may have inadequate control and monitoring programmes necessary to prevent or even detect the theft of these materials.'[67] The IAEA estimates that there are over 10,000 medical radiotherapy units in use worldwide; approximately 12,000

66. 'IAEA Cites Inadequate Control of World's Radioactive Materials', US Department of State, International Information Programs, June 2002.

67. 'Inadequate Control of World's Radioactive Sources', International Atomic Energy Agency, Press Release, 25 June 2002.

industrial sources for radiography supplied annually; and about 300 irradiator facilities containing radioactive sources for industrial applications. The agency identifies industrial radiography, radiotherapy and thermo-electric generators as being notable risks because they contain significant amounts of material such as such as cobalt-60, strontium-90, caesium-137 and iridium-192.[68]

The damage associated with a 'dirty bomb' is difficult to predict. The most serious consequences of a dirty bomb could be the associated social disruption and economic costs. While most experts agree that the medical impact of an RDD would be limited, the primary physical effects associated with exposure to radiation include:

- *Acute Radiation Syndrome (ARS):* an acute illness caused by a high dose of penetrating radiation in a very short period of time. Onset can occur days or weeks after exposure. The immediate symptoms of ARS are nausea, vomiting and diarrhoea; later, bone marrow depletion may lead to weight loss, loss of appetite, flu-like symptoms, infection and bleeding. The survival rate depends on the radiation dose.[69]
- *Cutaneous Radiation Syndrome (CRS):* damage caused by acute radiation exposure to the skin. Symptoms include inflammation, loss of hair, itching, intense skin reddening, blistering and ulceration. Severe exposure can cause permanent hair loss, damaged sebaceous and sweat glands, atrophy, fibrosis, decreased or increased skin pigmentation, and ulceration or necrosis of the exposed tissue.[70]
- *Prenatal Radiation Exposure:* occurs when a pregnant woman is exposed to radiation. The severity of health effects on the unborn child depends on the gestational age of the unborn baby at the time of exposure and the amount of radiation it is exposed to.[71]
- *Delayed effects of radiation exposure:* includes an increased risk of cancer.

Treating radiation exposure consists of decontamination. In most instances, removing the outer layers of clothing and taking a shower will suffice. Decontamination is important both for affected individuals and those they may encounter. Individuals who are externally contaminated with radioactive material can contaminate other people or surfaces that they touch.

Treating internal contamination is more complex.[72] There are a number of medical countermeasures that can be used in the

68. Op. cit. in note 66.

69. 'Radiation Emergencies, Fact Sheet: Acute Radiation Syndrome, Fact Sheet for Physicians', U.S. Centers for Disease Control (CDC); http://www.bt.cdc.gov/radiation/arsphysicianfactsheet.asp.

70. Ibid.

71. 'Prenatal Radiation Exposure: A Fact Sheet for Physicians', US Centers for Disease Controls (CDC); http://www.bt.cdc.gov/radiation/prenatalphysician.asp.

72. For more see Frank Mettler and George Voelz, 'Major Radiation Exposure – What to Expect and How to Respond', *New England Journal of Medicine*, 346, 2002, pp.1554-61.

event of radiological exposure. Three compounds used in such countermeasures are: potassium iodide (KI), diethylenetriamine-pentaacetate (DTPA), and ferric ferrocyanide, also known as Prussian blue (PB).[73]

In addition to the effects on living organisms, physical areas exposed to radiation are likely to be evacuated pending decontamination. This can be both time-consuming and costly. While the physical effects of an attack using conventional weapons are immediate, the effects of a radiological attack could be felt for years. For example, the radioactive material caesium-137 has a half-life of 30 years.[74]

Detecting radiological elements

Detecting radiological elements is challenging. Humans cannot see, smell, feel or taste radiation. Various devices are used to detect radiological exposure. Individuals who work in high-risk areas or medical personnel are likely to use direct reading dosimeters (DRDs), thermoluminescent devices (TLDs), film badges and/or Geiger-Müller (G-M) counters to estimate the degree of exposure.[75]

Analysis: radiological weapons

The immediate impact of an RDD is likely to be limited. It is thought that a likely RDD scenario is approximately 20 deaths and 500 injured – all caused by the effects of the explosives. Although the radioactive materials are unlikely to result in immediate deaths, the impact may be extensive and long-lasting. Some individuals – including first responders – may present some of the radiation symptoms described earlier. A much larger group of people, most likely in the thousands (if the event takes place in a heavily populated area), will think they are contaminated. This can result in mass panic, evacuations and saturation of the health services. '[I]n the 1987 Cs-137 accident in Goiânia, Brazil, 8.3% of the first 60,000 people screened, presented with signs and symptoms consistent with acute radiation sickness: e.g., skin reddening, vomiting, diarrhoea, although they had not been exposed.'[76] This psychological dimension of an RDD attack has a significant human and financial cost.

Although an RDD is likely to result in limited physical damage, the economic impact could be great. Initial tasks, such as evaluat-

73. For a comprehensive discussion of medical countermeasures, see the US Department of Homeland Security Product on Medical Treatment of Radiological Casualties, Working Group on Radiological Dispersal Device (RDD) Preparedness Medical Preparedness and Response Sub-Group, 9 December 2003.

74. Phil Anderson, 'Radiological Dispersal Devices: The "Dirty Bomb" Challenge, A CSIS White Paper', Center for Strategic and International Studies (CSIS), p. 10. According to the author, '. . . Caesium 137 is a fission product produced from weapons testing and nuclear reactors. Caesium is used commercially in nuclear medicine (radiation therapy), in the accurate atomic clock, and as a check source in the calibration of radiation detection instruments. CS-137 has a half-life of 30 years and emits both beta and gamma radiation. Beta particles are potentially dangerous; especially when material such as CS-137 is ingested or breathed. Gamma ray emissions can readily penetrate the skin and expose internal organs to ionizing radiation. Although, Caesium-137 has low toxicity, it can replace potassium in the body and therefore, be harmful.'

75. A *dosimeter* is a device that measures the total accumulated exposure to ionizing radiation. A direct-reading dosimeter, also called a 'pocket meter' or 'pocket ionization chamber', is a small air-filled instrument. This device primarily detects photon radiation (i.e., gamma rays, x-rays) and sometimes detects high-energy beta radiation. A *thermoluminescent dosimeter*, or TLD, contains materials which absorb and trap energy when they are exposed to radiation. When the materials are heated at a later date in a device known as a 'TLD reader', the trapped energy is released in the form of light. The amount of light is then related to the radiation dose. A *film badge* consists of a piece of film similar to camera film that is placed in a small holder. The film darkens when it is exposed to radiation: the darker the film, the higher the radiation exposure. The type of radiation can also be determined.

ing the affected area and determining the level of decontamination required, take time. The decontamination process itself is time- and labour-intensive. Thus, any activities that normally take place within the affected areas will be shut down for days or months. Once the decontamination process has ended, psychological factors may surface as people refuse to move back in or real-estate values plummet. The costs associated with an RDD can thus rapidly enter the multi-million euro range.

What policy-makers should focus on

With respect to chemical weapons, there are clearly many agents that terrorists could employ to conduct an attack. Which agents and methods should policy-makers focus on? While comprehensive efforts should be made to prevent, protect, and prepare for any type of CBR attack, TICs should be of particular concern as they are more readily available than military-grade chemical agents.

In terms of supply, there are thousands of facilities across Europe that use and house chemicals like chlorine, cyanide, and phosgene. On any given day across Europe, vast amounts of toxic industrial chemicals are transported by rail or road across the EU. While they may be secure vis-à-vis transportation requirements, they are likely to be vulnerable to physical attack. In addition, many industrial facilities store toxic chemicals in their outdoor facilities – including in unprotected railway vans.[77]

Besides the vulnerabilities raised by accessible depots and locations, the availability of precursor chemicals that can be utilised to produce other agents – such as nerve agents – should be highlighted. For example tabun, a fairly persistent agent, is manufactured from four precursor chemicals that are in wide use commercially.

Concerning radiological weapons, radioactive source material may be found within industry, hospitals and research laboratories inside the EU. Specific examples range from hospital instruments used to treat tumours to industrial sterilisation equipment. It is estimated that about 500,000 radioactive sources have been supplied over the past fifty years to operators within the EU-15.[78]

An EU study has estimated that up to 70 sources are lost from regulatory control in the EU each year. Moreover, a European Commission report has identified approximately 30,000 disused

Another well-known tool for detected radiological elements is the *Geiger-Müller counter*. Known to many people as a Geiger counter, it is a highly sensitive gas-filled detectors that measures radiation and comes in a variety of forms. There are two other types of gas-filled detectors: proportional counters and ionization chamber. The devices can be read immediately to determine how much accumulated exposure someone has received, or they can 'chirp' if the accumulated exposure has reached a predetermined level. 'External Exposure Monitoring', Integrated Environmental Management, Inc., 1998; http://www.iem-inc.com/prextr.html.

76. Department of Homeland Security Product on Medical Treatment of Radiological Casualties, Working Group on Radiological Dispersal Device (RDD) Preparedness Medical Preparedness and Response Sub-Group, 9 December 2003. p. 35.

77. Although it should be noted that the Seveso II directive from 1999 aims to limit the potential for inadequate storage of chemicals within the EU. For more details on the Seveso Directive see http://europa.eu.int/comm/environment/seveso/#2.

78. Vittorio Ciani, 'Radiation sources in the EU: a review of steps in the European Union', *IAEA Bulletin*, 41/3/1999; http://www.iaea.org/Publications/Magazines/Bulletin/Bull413/article7.pdf.

sources in the EU that are held in local storage at the users' premises are at risk of being lost to regulatory control. Fortunately, the majority of these sources would not pose a significant radiological risk if used in a dirty bomb.[79] This is because the levels of radiation created by most probable sources are not sufficient to cause severe illness. In this instance, the biggest risk associated with the bomb would be the blast itself and associated psychological effects.[80]

However, there are risks as long as radiation sources are vulnerable or unaccounted for. There is definite interest in gaining access to such materials. According to the IAEA's Illicit Trafficking Database, there were 540 confirmed incidents involving illicit trafficking in nuclear and other radioactive materials between 1 January 1993 and 31 December 2003.[81]

So what is the EU doing to protect itself against chemical, biological or radiological attacks? The next section of the report looks at EU preparedness for all types of CBR events in more detail. Emphasis is given to activities that have occurred since 11 September 2001.

79. IAEA, op. cit.

80. 'Radiation Emergencies, Fact Sheet: Dirty Bombs', US Centers for Disease Controls (CDC); http://www.bt.cdc.gov/radiation/dirtybombs.asp. The factsheet notes that in 1987 Iraq tested a dirty bomb but discovered that the radiation levels were too low to cause significant damage and therefore abandoned further use of the device.

81 IAEA 'Facts and Figures: Illicit Nuclear Trafficking Statistics: January 1993 – December 2003'; http://www.iaea.org/ NewsCenter/Features/RadSources/Fact_Figures.html.

What CBR response measures exist at the EU level?

In a border-free Europe, measures must be available at the EU level to ensure adequate coordination and response in the case of a large-scale CBR attack. Since the 11 September attacks in the United States, the EU has stepped up its efforts to complement and bolster EU member states' ability to respond in the event of an attack. While first responders and other authorities within member states represent the first line of defence in the event of an attack, EU-wide actions are necessary to enhance coordination, provide a platform for cooperation with third parties and facilitate burden sharing if needed.

Within the European Union, the Council of the EU (hereafter Council) and the European Commission (hereafter Commission) spearhead CBR coordination and response efforts. The Civil Protection Working Party (PROCIV) is the principal group responsible for efforts within the Council. In the Commission, the Directorate General Environment containing the Civil Protection Unit is one of the principal actors.[82] This chapter provides an overview of measures taken by the EU since 11 September 2001.

The EU response since September 2001

The Ghent European Council held in October 2001 asked the Council and the Commission to prepare a programme to improve levels of cooperation between member states vis-à-vis chemical and biological terrorism.[83] The heads of state or government of the European Union and the President of the Commission declared that the CBR threats '[called] for adapted responses on the part of each Member State and of the European Union as a whole'.[84]

82. It should be noted that Commission initiatives may involve a number of functional units, including civil protection, health, enterprise (pharmaceuticals), research, environment, nuclear, transport, trade, general enterprise and energy fields.

83. The scope of the programme was expanded in June 2002 to include nuclear and radiological terrorism. See 'Draft programme to improve cooperation in the European Union for protecting the population against bacteriological, chemical, radiological or nuclear terrorist threats', Council of the European Union, 9593/02, Brussels, 5 June 2002. See also document 9593/02 COR 1.

84. Declaration by the Heads of State or Government of the EU and the President of the Commission. 'Follow-up to the September 11 attacks and the fight against terrorism', Ghent, 19 October 2001.

The Community civil protection mechanism

One of the first measures taken after the Ghent Council was strengthening of the existing Community Action Programme for civil protection, which is to be updated again in 2004.[85] On 23 October 2001, the Council established the 'Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions'.[86] The mechanism, which has been in effect since 1 January 2002, and will be revised in 2005, has the following tasks: [87]

- *Identifying intervention teams and other support available in member states in the event of an emergency*. The Commission's Civil Protection Unit (CPU) presently maintains a list of available CBRN experts within the EU. As of December 2003, the database contained approximately 6,700 individuals specialising in areas such as CBRN, logistics, search and rescue, decontamination, etc.[88]
- *Establishing assessment and/or coordination teams – including dispatching such teams when needed.* Besides identifying CBRN experts, the mechanism can be engaged during emergencies. For example, the mechanism was employed during the oil tanker *Prestige* disaster, when the Commission's Monitoring and Information Centre (MIC) launched 8 different requests for assistance. The requests yielded additional ships, aircraft and equipment from a number of participating countries that were placed at the disposal of France, Spain, and Portugal.[89] Pre-identified teams should be deployable within 12 hours.
- *Setting-up and implementing a training programme for intervention teams and other coordination teams*. Since mid-2003, some 30 training courses have been planned. Six courses are planned for 2004 and 14 for 2005. The courses will cover CBRN, natural disasters, and technological disasters.[90] To maximise the benefits from these training courses, the Commission has introduced an Exchange of Experts Programme to be used by participating countries to share their experiences. EU funding for these and related activities is roughly €5 million.
- *Establishing and managing a monitoring and information centre.* A continually operating MIC was launched in October 2001 within the Commission.[91] If an EU member state is hit by a major natural or man-made disaster, it can send an assistance request to the MIC. The MIC serves as the 'nerve centre of the

85. The Commission had already taken a first step towards defining an EU Civil Protection strategy in 2000 when it proposed a strengthened Community mechanism for civil protection.

86. 'Council Decision of 23 October 2001 establishing a Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions', Decision 2001/792/EC, *Euratom – Official Journal* L 297, 15 November 2001. For information on the Community action programme see the 'Council Decision establishing a Community action programme in the field of civil protection', Council of the European Union 13075/99, Brussels, 29 November 1999.

87. 'Proceedings from Working Party on Civil Protection', Council of the European Union, 11766/03, 24 July 2003.

88. 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Commission of the European Communities', COM(2004) 200 final, 25 March 2004.

89. Ibid.

90. Council of the European document 8715/04, Brussels, 22 April 2004.

91. Specifically, within the D directorate (Life Programme, Legal Implementation and Civil Protection) in the Environment DG (Directorate General).

mechanism as it is here that information is received from the various networks and the Member States'.[92]

- *Establishing and managing common emergency communication and information systems.* There are a number of existing networks that are linked in order to enhance communication and information sharing. For example, the MIC maintains links with the epidemiological surveillance and control of communicable disease network. A dedicated Common Emergency Communication and Information System (CECIS) should be operational by the end of 2004.

The Health Security Programme (BICHAT)

On 26 October 2001, a Health Security Committee (HSC) was established. Consisting of senior representatives from member state health ministries, the HSC represents the main collaborative instrument for countering the deliberate release of biological and chemical agents within the European Union. The HSC is the body through which emergency plans and simulations are modified or changed. It also issues clinical guidelines and drafts disease surveillance measures. The HSC contains five working groups covering the following areas: laboratories, chemicals, clinical guidelines, emergency plans/modelling and biological agents.

In December 2001, following a proposal by the Commission, the HSC presented a Health Security Programme on preparedness and response to biological and chemical agent attacks. Known as BICHAT (programme of cooperation on preparedness and response to biological and chemical agent attacks), the programme identifies 25 actions grouped under four main objectives:

- establishing a mechanism for *information exchange*, consultation and coordination to facilitate the handling of health-related issues associated with potential BC use;
- creating an EU-wide capability for the timely *detection and identification* of biological and chemical agents that may be used in attacks – including the rapid and reliable determination and diagnosis of relevant cases;
- creating a *medicines stock*, health services database, and stand-by facility to speed up the availability of medicines and health care specialists in case of need;

92. 'Inventory of EU-instruments relevant for the programme of the Council and the Commission, of 20 December 2002, to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats', Council of the European Union 15873/02, 20 December 2002.

- drawing up and disseminating guidance rules to improve health responses in the event of an attack – including the *coordination* of an EU response and links with third countries and international organisations.[93]

Since the introduction of BICHAT, a number of advances have taken place in all four objective areas. These are summarised below.

Information exchange

With respect to the first BICHAT objective, an alert mechanism was introduced in June 2002 to facilitate the exchange of information across the EU. Code-named RAS-BICHAT, it is active at all times and links the HSC with specific points of contact – such as health authorities and laboratories – across Europe.[94] RAS-BICHAT can tap into other networks such as those for civil protection, radiological emergencies, communicable diseases and food alerts.[95]

The HSC uses this mechanism to communicate in the case of health-related incidents, to advise on preparedness and response, and to coordinate emergency planning at the EU level.[96] Operationally, the system works though a combination of secure telephone, fax and the Internet. The system also supports the use of video teleconference. As of January 2004, RAS-BICHAT has been used fifteen times.[97]

The RAS-BICHAT network and the existing Early Warning Response System (EWRS) on communicable diseases will gradually be reinforced through the introduction of a Medical Intelligence System (MedISys). MedISys will serve to detect and track diseases of concern.

Detection and identification

With respect to the second BICHAT objective, the European Agency for the Evaluation of Medicinal Products (EMEA) has developed a list of potential biological agents that may be used during a chemical or biological attack. The agents have been categorised according to ease of dissemination, toxicity, infectiousness, persistence, and availability of vaccines, prophylaxis, and serums. The list of pathogens has been introduced into the EU's communicable disease surveillance network.

93. 'Programme of cooperation on preparedness and response to biological and chemical agent attacks [Health Security]', Commission of the European Communities, G/FS D(2001) GG, 17 December 2001.

94. Non-urgent information can be shared through the Non-Urgent Information System (NUIS).

95. Specifically, there are nine RAS partners within the Commission: the Early Warning System on Communicable diseases (EWRS) within DG SANCO/G/4, the Monitoring and Information Centre (MIC) within the DG Environment/B/4, The Radiological emergency preparedness network (ECURIE) within DG Environment/C/4, Protection of consumer health in relation to food and feed (RASFF) within DG SANCO/D/3, The Animal Disease notification system (ADNS) within DG SANCO/E/2, The Phytosanitary network (EUROPHYT) within DG SANCO/F/4 (Europhyt is concerned with organisms harmful to plants), External Relations Crisis Management (RELEX), Protection of consumer health and safety (RAPEX) within DG SANCO B/3, and Health controls of imports of veterinary concern (ANIMO/SHIFT) within DG SANCO/E/3. George Gouvras, 'Bioterrorism: The scourge of the 21st century?', Task Force on Health Security, presentation given on 30 October 2002.

96. For more information see 'Revised Note For Guidance on the Rapid Alert System (RAS) and Non-Urgent Information System (NUIS) in Human Pharmacovigilance', The European Agency for the Evaluation of Medicinal Products (EMEA), 29 July 1999; http://www.emea.eu.int/pdfs/human/phvwp/000596en.pdf.

97. 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions', Commission of the European Communities, COM (2004)200 final, Brussels, 25 March 2004.

In addition to the EMEA list, national experts designated by the HSC have released clinical guidelines for the recognition and case management of CB-related symptoms. As of mid-2003, ten manuscripts had been drafted to cover pathogens such as anthrax, smallpox, botulism, plague, and tularaemia.

To ensure effective support between different laboratories, the Commission is promoting memoranda of understanding between member states' different national laboratory systems. A link has been established between safety level four (P4) laboratories within the EU to ensure timely diagnostic services to all member states. It should be noted that only six P4 laboratories exist among the EU fifteen 'suitable for the handling and confirmation in samples and specimens of high-risk agents such as haemorrhagic fever viruses'.[98]

Medicine stocks

With respect to the third objective, two working groups on medicine stocks have been established through the EMEA.[99]

The first, known as the Committee for Proprietary Medicinal Products (EMEA/CPMP), aims to develop guidelines for the use of medicines against potential pathogens.[100] A document was released on 16 January 2002 covering the diseases of greatest concern, also known as 'category A' diseases: anthrax, smallpox, plague, tularaemia, viral haemorrhagic fevers and botulism.[101] An extended version of the document was released in July 2002.

The second working group, informally known as the EMEA vaccines working group, was tasked to produce a study on vaccination recommendations – with particular attention to smallpox vaccines. Not all EU member states stockpile antibiotics at the national level. Some rely on requirements placed on pharmacists, distributors or hospitals to ensure access in time of need. These mechanisms do not necessarily incorporate the antibiotics that are the most suitable for countering bioterrorist attacks. A Commission proposal suggesting the creation of a 'virtual' vaccine stockpile whereby 20-30 per cent of the vaccines would be administered at the EU level has been rejected to date.

In parallel with these efforts, a Commission-pharmaceutical industry task force was established in December 2001 to analyse the production capability, availability, storage and distribution networks for vaccines and other medicines that may be relevant in

98. 'Communication from the Commission to the Council and the European Parliament on cooperation in the EU on preparedness and response to biological and chemical agent attacks', Commission of the European Communities, COM(2003) 320 final, Brussels, 2 June 2003, p. 11. The author has not been able to confirm whether this figure has changed post EU enlargement.

99. Among the specific units involved both inside and outside the Commission were the Enterprise DG, the Pharmaceuticals Unit, the EMEA and its Scientific Committee and the Committee for Proprietary Medicinal Products (CPMP).

100. 'EMEA/CPMP Guidance document on use of medicinal products for treatment and prophylaxis of biological agents that might be used as weapons of bioterrorism', The European Agency for the Evaluation of Medicinal Products (EMEA), 25 July 2002; http://www.emea.eu.int/pdfs/human/bioterror/404801.pdf.

101. 'Biodefense: A need for understanding and the critical role of science teachers', *The Natural Selection*, Fall 2002, and 'NIAID Unveils Biodefense Research Agenda', NIAID press release, Thursday, 14 March 2002.

the event of a biological attack. The task force exchanges information through a specific network established by the Pharmaceutical Committee.

International cooperation

The final objective of BICHAT – dissemination and cooperation with third parties – represents an ongoing process. The Council and Commission maintain contact and exchange information with a number of organisations such as the US Centers for Disease Control and Prevention (CDC), Organisation for the Prohibition of Chemical Weapons (OPCW), the International Programme on Chemical Safety (IPCS), International Atomic Energy Agency (IAEA), the European Association of Poison Control Centres and Clinical Toxicologists (EAPCCT) and NATO. With respect to non-proliferation efforts, all EU members are part of the Biological and Toxin Weapons Convention (BTWC), the Chemical Weapons Convention (CWC), and the Australia Group. In December 2003, the EU adopted its strategy against the proliferation of weapons of mass destruction.[102]

The Commission also collaborates bilaterally with the World Health Organisation (WHO) on a number of areas aiming to counter the release of biological and chemical agents.[103] In addition to frequent meetings, there is joint work on the production of biological products such as vaccinia immune globulin (which contains antibodies to vaccinia virus) and chemical agents, and on global health intelligence.

Finally, the EU is part of international networks dealing with health issues, such as the Global Health Security Action Group.[104] The group provides institutions with a way to pool resources in the event of a health-related outbreak. Among its members are scientific institutions, UN organisations like UNICEF and UNHCR, the Red Cross, and non-governmental organisations such as Doctors Without Borders/Médecins sans Frontières.

The 2002 CBRN programme

On 20 December 2002, the Council and the Commission adopted the 'Programme to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological, or nuclear terrorist threats'.[105] Besides reviewing

102. *EU strategy against proliferation of weapons of mass destruction.* Council of the European Union, document 15708/03, Brussels 10 December 2003.

103. The WHO keeps an emergency stock of about 500,000 doses of the smallpox vaccine in the Netherlands. Barry James, 'Small virus: the secret stocks', *International Herald Tribune*, 14 January 2003, p. 2.

104. The group was formed following the meeting of health ministers from G-7 countries together with the health minister of Mexico, Commissioner Byrne and representatives from the (WHO) in Ottawa in November 2001.

105. 'Adoption of the Programme to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological, or nuclear terrorist threats', Council of the European Union 14627/02, Brussels, 21 November 2002.

measures and legislation already in place, it spelled out additional objectives to facilitate a multi-sector response in the event of a CBRN attack. The programme's mandate is 'to improve cooperation between the Member States on the evaluation of risks, alerts and intervention, the storage of such means, and in the field of research'.[106] In addition, the programme is tasked to cover 'the detection and identification of infectious and toxic agents as well as the prevention and treatment of chemical and biological attacks . . .'[107]

The programme sets out seven strategic objectives, several of which were introduced under earlier initiatives, to guide current and future work in the area. Progress made towards reaching these strategic objectives is reviewed annually on the basis of information transmitted by the member states. A progress report is presented to the Council annually. The first such report was presented by the Italian presidency in December 2003.[108] The objectives and progress to date are:[109]

1. *To strengthen the risk analysis and the risk assessment of threats of CBRN-terrorism and their lines of propagation*. According to the progress report unveiled during the Italian presidency, relevant Council bodies and other entities have carried out risk assessments for 9 regions and 55 countries. The information is obtainable from specific points of contact in the member states, but is not publicly available. The assessments are based on the exchange of information on terrorism-related incidents.[110]
2. *To reduce the vulnerability of the population, the environment, the food chain and property against CBRN threats through preventive measures*. The Commission has produced a report listing the steps taken to reduce vulnerabilities in the areas mentioned above. Proposals for enhancing civil aviation and maritime transport regulations have also been issued. Finally, under the Civil Protection Action Programme, a call for proposals has been issued to study ways of informing the public in times of emergencies.
3. *To ensure quick detection and identification of an actual attack and spread of information (monitoring, warning and communications)*. The three main communication and information systems, RASBICHAT (health), ECURIE (radiological), and CECIS (civil protection, not yet operational) have been enhanced and their mutual coordination improved.[111] A radiological data system known as EURDEP (European Union Radiological Data Exchange Platform) is being incorporated into the emergency

106. Ibid, p. 4.

107. Ibid, p. 4.

108. 'First annual Presidency report (2003) to the Council on the implementation of the joint Programme of the Council and the Commission, of 20 December 2002, to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats', Council of the European Union, 16285/03 EXT 1, Brussels, 22 January 2004.

109. 'Adoption of the Programme to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological, or nuclear terrorist threats', Council of the European Union 14627/02, Brussels, 21 November 2002.

110. It should be noted that EUROPOL also prepares assessments of terrorist threats in Europe. Recent editions of such threats include threats posed by CBRN weapons.

111. ECURIE stands for European Community Urgent Radiological Information Exchange. The system uses coded information to minimise the potential for misunderstandings due to language barriers. Its availability is tested through regular exercises.

arrangements to allow the automatic availability of radiological measurements in the event of a radiological incident. Finally, the Commission has introduced amendments to legislation on public health and clinical guidelines.

4. *To mitigate the consequences of an attack, to facilitate the return to normal conditions, and to use and continue developing instruments needed for efficient consequence management.* The principal tool in this area is the Community Mechanism adopted in 2001. A database of military assets and capabilities that could be used in the event of a CBRN attack has been established.
5. *To strengthen the scientific basis of the programme.* In late 2002, the Commission issued a call for proposals to explore methods for improving CBRN research-related efforts.[112]
6. *To cooperate with third countries and international organisations.* Spearheading this effort is international cooperation in the health arena, in particular through the Global Health Security Action Initiative.
7. *To ensure efficient use and coordination of the instruments used in implementing the programme.* On the Council side, the Civil Protection Working Party has a general monitoring role over CBRN protection activities while the Commission is tasked with facilitating the exchange of information.[113] The Italian presidency, acting in cooperation with the Commission, issued an inventory of the instruments relevant to the programme.[114]

CBR training exercises

CBR training exercises at the EU level provide an important avenue for testing the EU's capacity to respond to a CBR-related attack. To date, the EU has only carried out one large-scale exercise to test such response capabilities.[115] Under the auspices of the European Commission, exercise EURATOX 2002 was launched on 27-28 October 2002 at the Canjuers (Var) military training area in France. The exercise simulated a terrorist group detonating a radiological device in a sports stadium and cinema. The objectives of the exercise were to:

- test the aid control channels within EU member states in the event of an attack, and
- activate and test the European Civil Protection Mechanism by requesting assistance from other members through the MIC.[116]

112. Including how to best take advantage of the 6th Framework Programme (2002-06).

113. 'First annual Presidency report (2003) to the Council on the implementation of the joint Programme of the Council and the Commission, of 20 December 2002, to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats', Council of the European Union, 16285/03 EXT 1, Brussels, 22 January 2004.

114. 'Inventory of EU-instruments relevant for the programme of the Council and the Commission, of 20 December 2002, to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats', Council of the European Union 15873/02, Brussels, 20 December 2002.

115. EURATOX was immediately preceded by a smaller simulation exercise – *Common Cause 2002*. The exercise tested the communication link between the MIC and five member states (Denmark, UK, Sweden, Belgium, and Italy) between 17 and 18 October 2002.

116. Rapid Press Release DN:IP/02/1498, 16 October, 2002.

EURATOX 2002 involved the treatment and evacuation of approximately 200 'wounded' individuals. An additional 2,000 people 'required assistance'. Excluding France, teams from five other EU member states were activated through the MIC. Overall, teams of 10-30 responders from Austria, Spain, Greece, Italy and Sweden took part in the exercise. An additional 800 emergency response personnel were called in from national, regional and European operational civil protection centres.

The exercise was considered successful, particularly concerning the identification and use of local assets. Approximately 600 hospital beds were identified on the first day of the exercise. The beds were made available within two to six hours. On the following day, an additional 800 beds were identified. Five medical airplanes were used to evacuate the victims to the respective hospital locations.[117]

To date, the follow-up exercises to EURATOX 2002 have been limited to training courses. The focus has been on sharing lessons learned. Examples of exercises carried out in 2003 include the tabletop exercise 'EU Response 2003' and the 'Florival 2-One Year After' workshop.[118]

Research

In October 2001, an R&D Expert Group (R&D EG) was created by the Research Ministers' Council. One aim of R&D EG is to improve efforts at countering the effects of biological and chemical terrorism. The group consists of EU member state personnel representing a number of government departments such as defence, health, research and civil protection. The group also contains personnel from research establishments across Europe. The members of the group can exchange information through a restricted access website. Among the research tracks considered so far are:

- an inventory of member state and EU-level research activities for countering the effects of BC terrorism;
- an examination of how these research activities could be better coordinated; and
- identification of current research gaps and needs, in both the short and long run.

In addition to the R&D EG, the Joint Research Centre (JRC) provides the European Commission with access to in-house scien-

117. Debriefing de l'exercise EURATOX 2002; http://www.samu-de-france.com/default_zone/fr/html/page-565.asp.

118. ' "I/A" Item Note', Council of the European Union, 16062/03, Brussels, 17 December 2003, p. 30.

tific and technical expertise in the nuclear, biological and chemical field. The JRC usually operates in networks with research centres and national laboratories.[119] In 2002, the JRC launched two prospective studies on vulnerabilities to bioterrorism. The first focused on the scientific issues and questions, while the second assessed the societal vulnerabilities to possible terrorist attacks.[120]

The EU also set up a bioresponse working group consisting of experts from member states. Under the auspices of the European Network of genetically modified organisms (GMO) laboratories coordinated by the JRC, the group considers scenarios for emergency response and vaccine production. The group devotes specific attention to the context of agro-terrorism.

Finally, the Commission is considering which priorities under the 6th Framework programme can be applied to build knowledge and tools for identifying biological and chemical agents.[121] Related efforts are evident in the recently released European Security Research Programme (ESRP) which identifies areas of research relating to CBRN protection.

Military assets

Most EU member states have specialised military personnel and equipment allowing them to perform tasks in a CBR environment. While these assets tend to be geared toward force protection – i.e. to ensure the wellbeing of troops in a CBR environment – they have applications in the field of detection and consequence management. Military capabilities and equipment may be increasingly relevant for ensuring security within the EU – especially in areas such as decontamination.[122]

At the EU level, military capabilities such as these can be used 'on a case by case basis, to support civil protection measures against CBRN terrorism' within the EU.[123] The March 2004 European Council summit called for continued work to develop an ESDP contribution to the fight against terrorism. The approval of a solidarity clause closely resembling that laid down in Article 42 of the draft Treaty establishing a Constitution for Europe further strengthens the possibility of using military capabilities to handle CBR events. According to the clause, EU member states 'shall act jointly in a spirit of solidarity if one of them is the victim of a terrorist attack. They shall mobilise all the instruments at their

119. 'Communication from the Commission to the Council and the European Parliament. Civil protection - State of preventive alert against possible emergencies', COM(2001) 707 final.

120. 'Civil Protection – Progress made in implementing the programme for preparedness for possible emergencies', Commission of the European Communities COM(2002) 302 final.

121. 'Communication from the Commission to the Council and the European Parliament on cooperation in the EU on preparedness and response to biological and chemical agent attacks', Commission of the European Communities, COM(2003) 320 final, p. 19.

122. For a short and current overview of military capabilities in this area see Andy Oppenheimer, 'To protect and Detect – Briefing on nuclear, biological, and chemical detection', *Jane's Defence Weekly*, vol. 41, no. 15, 14 April 2004, pp. 22-9.

123. Council of the European Union, Doc. 9787/03, 26 May 2003, p. 11.

disposal, including military resources to:

- prevent the terrorist threat in the territory of one of them;
- protect democratic institutions and the civilian population from any terrorist attack;
- assist a Member State or an acceding State in its territory at the request of its political authorities in the event of a terrorist attack.'[124]

In certain EU member states, military resources within the territory can be used to handle a number of different situations. These may include consequence management after a CBR attack (this is covered in greater detail in the next chapter). Several EU member states also possess paramilitary personnel trained for a range of contingencies within their national borders. Thus, several options exist for the use of military resources in demanding situations such as terrorist attacks using non-conventional weapons. At the EU level, however, many questions remain concerning the use of military assets. A related discussion is the use of NATO resources and the steps that organisation has taken to enhance civil preparedness against possible CBR attacks. The following section provides a brief overview of such efforts.

NATO civil defence assets

The NATO Allies approved a Civil Emergency Planning Action at the November 2002 Prague summit. The plan envisages the possibility of NATO support for managing the consequences of a CBR attack if requested by national authorities.[125]

At the operational level, NATO has a Euro-Atlantic Disaster Response Coordination Centre (EADRCC). It carries out exercises and training courses to improve overall preparedness in the event of CBR disasters or terrorist attacks (post-9/11). For example, in early October 2003, the EADRCC organised an exercise (Dacia 2003) simulating a terrorist attack using a dirty bomb in Romania. Aiming to test the coordination of international response operators, the exercise involved 320 individuals representing 19 different EAPC member countries. About 1,300 Romanian personnel took part in the exercise. In the event of an emergency, a non-standing Euro-Atlantic Disaster Response Unit (EADRU) can be formed consisting of national elements provided by EAPC members.[126]

124. *Declaration on Combating Terrorism*, European Council Meeting, March 2004.

125. For example, NATO will send CBRN personnel and assets to Greece as an emergency response in the event of a CBRN attack during the upcoming Olympic Games. 'NATO/GREECE: AWACS, NRBC Battalion and NATO Maritime Surveillance at Olympic Games.' *Atlantic News*, No. 3587, 26 June 2004.

126. 'Standing Operating Procedures for the Euro-Atlantic Disaster Response Unit (EADRU).' http://www.nato.int/eadrcc/sop/sop.htm.

EU Limitations

While substantial initiatives are being taken at the EU level relating to CBR protection, it is important to recognise that limitations exist. This section provides a brief overview of some of the main challenges facing the measures described in this chapter.

Community mechanism limitations

The principal challenges associated with the Community mechanism revolve around the MIC. First, member states are not obligated to inform the Monitoring and Information Centre in the event of an event, even if it has transboundary effects. From a different angle, if an affected country asks for assistance bilaterally and then also engages the MIC, resources may be duplicated unnecessarily.

Second, since the centre coordinates voluntary assistance, it is the responsibility of EU member states to produce the necessary assets to respond to an emergency situation. For example, during the summer forest fires in Portugal in 2003, political willingness to help was initially signalled by 21 countries. In the end, commitments came from only two countries: Italy (2 *Canadairs*) and Germany (3 helicopters).[127]

Third, the MIC is limited by the relatively small size of the CPU that mans it. Although the initial size of the Civil Protection Unit's staff has more than doubled since April 2002, it currently numbers only 14-15 staff (as of June 2004). Once administrative staff is included, the size of the CPU is close to 20. The implications of a small staff are far-reaching. Currently, there is usually only one duty officer manning the MIC at any given moment. During exercises or emergencies, the number may increase to 3 or 4 officers.[128] With respect to planning, a limited staff size makes it is difficult to assemble and update a detailed database on assets available for dealing with a catastrophe. For the database to be effective, it needs to be continually updated and staff need to ensure that what is listed is truly available (for example, it is not useful to list equipment that is damaged or otherwise unavailable). The fact that the CPU staff associated with the MIC are not necessarily specialists makes the task more challenging.

Currently, the database of CBRN-qualified experts is basic and includes little information on the available equipment. During

127. 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions', Commission of the European Communities, COM(2004) 200 final, Brussels, 25 March 2004.

128. Personnel in the Commission Security Office may alert the MIC in case of an emergency which is reported directly to them.

the floods in southern France in 2003, a demand for high capacity pumps (pumps that can displace roughly 1.9 million m3 per day) was difficult to meet since the database did not provide information on equipment capacity and compatibility. Ultimately, only four out of seven countries were able to provide the required assistance, and of these only one country had registered an intervention team equipped with pumps in the database – and even then the capacity of the pumps was unspecified. A larger and specialised staff would allow the CPU to identify these additional assets and expand its databases. Ideally, additional staffing would also make it possible to collect and maintain up-to-date information on the costs associated with certain equipment and response capabilities. Specialised staff would also allow countries requesting aid to be more specific by providing asset needs in detail.

A limited staff size also makes it difficult to produce comprehensive, up-to-date, in-house threat assessments. This limits the MIC's ability to coordinate the deployment of assessment and response teams. Ideally, staff should have the capability to put together response packages based on pre-defined scenarios that correspond to viable threat assessments.

The small staff size may also explain why the unit's vade mecum, which provides a general overview of the measures taken by EU member states and other European Economic Area countries to handle disasters, has not been updated since 1999.[129] An updated version would give policy-makers across Europe better insights into the different national plans for dealing with emergencies.

The effectiveness of the civil protection unit is also limited by its budget. In the absence of a specific agreement between countries, the Community mechanism states that the country affected by a disaster shall bear the cost of assistance. According to the Commission, the experience with the forest fires in Portugal showed the limits of purely voluntary actions in the absence of a rapid source of finance. Rectifying this weakness would require the establishment of a funding mechanism that could cover initial emergency costs – such as transportation – which could be repaid at a later stage.[130]

The Commission is currently studying the possibility of extending Community financing for transport costs associated with the provision of assistance within the EU. An initial target date for such a fund is 2006. The size of the fund is estimated at

129. See 'Vade-mecum of Civil Protection in the European Union', European Commission, October 1999; http://europa.eu.int/comm/environment/civil/pdfdocs/vademec.pdf.

130. Presently, member states can request assistance through the Solidarity Fund. The EU Solidarity Fund (EUSF) provides financial assistance to support individuals, regions and countries after a catastrophic event. It was established as an EU instrument following the massive floods that hit central Europe in August 2002. Eligible costs include expenditures incurred for essential emergency operations, infrastructure restoration and rescue services. The coverage of rescue services extends to costs associated with the transportation and equipment of rescue services. Up to €1 billion can be mobilised in a given year.

around €6 million per year, based on the likelihood of 5 to10 events per year. This fund may be complemented by another fund of around €10 million annually to cover costs incurred during an emergency that overwhelms the affected member state.[131]

BICHAT limitations

BICHAT's main challenges exist in the communications and medicine stocks arena. With respect to communications, the RAS-BICHAT network is a passive mechanism whose relevance depends largely on its voluntary usage – if it is not used during a crisis, it is largely irrelevant.

With respect to medicine stocks, the idea of an EU vaccination stock has been rebuffed by member states, who argue that it would add no value to the current set-up of national stockpiles.[132] In addition, member states have voiced concern over the timely availability of vaccinations should such a system be introduced. Finally, member states are keen on keeping vaccination figures out of the public eye, especially if they are aggregated at the EU level.

With respect to the timely delivery of materials, measures taken in other countries suggest that effective pre-positioning can overcome such concerns. For example, in the United States, the Centers for Disease Control and Prevention manage the country's National Pharmaceutical Stockpile.[133] Materials, in the form of twelve 'push packages' are strategically located across the country, ensuring availability anywhere in the United States within twelve hours. Located in secure, climate-controlled warehouses, each package contains enough pharmaceuticals to treat the victims of a 'class A' agent attack for several days. The stockpile incorporates specific arrangements with manufacturers to quickly increase production in case of need.[134]

An EU-level vaccination stockpile would offer distinct advantages. First, it would give all EU member states access to a known stock of medical supplies. With respect to distribution, the European Pharmaceutical Wholesalers Association (GIRP) has already signalled its commitment to help develop a system for the central coordination of distribution networks across the EU if needed.[135]

Second, creating an EU-wide stockpile would provide eco-

131. Op. cit. in note 122.

132. 'Communication from the Commission to the Council and the European Parliament on cooperation in the EU on preparedness and response to biological and chemical agent attacks', Commission of the European Communities, COM(2003) 320 final.

133. The role of National Pharmaceutical Stockpile Programme is to identify, purchase, store and manage pharmaceuticals and medical supplies that will assist state and local jurisdictions in their response to a chemical or biological terrorism event. From Andrew Mulcahy, 'Fact Sheet 6: The National Pharmaceutical Stockpile' in 'Bioterrorism: Preparedness and Response: Fact Sheet Supplement', from the Woodrow Wilson School of Public and International Affairs at Princeton University.

134 'The Spores of War', *The Economist Special Report*, 30 November – 6 December 2002, p. 22.

135. Council of the European Union, doc. 12159/02, 18 September 2002.

nomic benefits through enhanced economies of scale and increased purchasing power. With the EU as a large-scale buyer, policy-makers would have greater leverage in terms of price negotiation and vaccine requirements. Third, benefiting from access to EU-25 expertise, the stockpile could be strategically filled with the most advanced vaccinations and prophylaxes. Fourth, the establishment of an EU-wide stockpile need not be mutually exclusive with national stockpiles should certain member states prefer to keep national stocks as well.

In spite of these benefits, the idea of an EU stockpile faces practical challenges. Beyond the costs associated with the initiation of such a programme, a number of questions would need to be resolved. For example, how would financing be arranged? What would be the role of the EMEA and the future European Centre for Disease Prevention and Control (ECDC)? How would locations of pre-positioned 'push packages' be determined? Policies and strategies would need to be developed so that appropriate measures could be taken, should more than one target area be affected simultaneously. Subsequently, the EU would have to take precautions to guard against the legal ramifications of adverse events associated with widespread use of drugs and/or vaccines.

Exercise limitations

Full-scale exercises represent key measures for testing capabilities in the event of an emergency. In the case of EURATOX 2002, several 'lessons learned' indicated the need for additional exercises. For example, Italian emergency crews noted that their fire hoses were not compatible with French fire hydrants.[136] Crews from different countries had trouble communicating when using jargon and acronyms. Even basic terms such as 'operations centre' or 'field commander' were difficult to relay across teams. Complicating the task was the need to communicate through walkie-talkies installed inside responders' protective suits/masks. As in most large-scale events involving different units, the exercise also highlighted confusion over the chain of command. According to Panagiotis Katsikopoulos, the Greek coordinator, information flows were not clear and the responsibilities of certain individuals were not clearly demarcated.[137]

136. In the author's discussion with several Italian firefighters, it became clear that Italy's firefighting equipment is of a size that will make it incompatible with most systems in other EU countries.

137. Thomas Fuller, 'Unified response to attack eludes Europe', *International Herald Tribune*, 14 January 2003.

Military limitations

While 'creative ambiguity' is the formula of choice concerning the use of military assets in the aftermath of a terrorist attack, there is a need to consider the conditions under which such resources could be used within the EU. These do not necessarily need to be restrictive. The aim should be to provide guidelines that are specific enough to allow clarity and predictability. Policy guidelines should provide the military establishment with a better overview of the types of missions that they could be called on to perform. For example, some existing military assets could be used for decontamination after an event. Such knowledge would allow planners to make better-informed decisions concerning training and procurement choices.

Synergies with NATO should be explored. While there are indications that there is increasing transparency in areas relating to CBRN, there is considerable overlap between the two that may fuel duplication and could lead to disputes.

Future steps

A number of potential developments in the EU with relevance to CBR protection could in future arise. Some, such as the establishment of an European Centre for Disease Prevention and Control (ECDPC), have already been approved and will be operational shortly. Others – such as the potential creation of a European Civil Protection Force (ECPF) – are at the exploratory stage.

Concerning the ECDPC, the European Commission presented the formal proposal for its establishment in September 2003.[138] The Centre will strengthen the Communicable Diseases Network created in 1999. According to the proposal, the Centre, either at its own initiative or at the request of the Commission 'will issue scientific opinions and risk assessments on a wide spectrum of issues related to communicable diseases, such as clinical medicine, epidemiology, microbiology, and preventive measures'.[139] Concerning chemical and biological issues, it is expected that the work currently carried out under the BICHAT programme 'will be evaluated and, according to the results, transferred to the Centre'.[140] Expected to be operational in 2005, the Centre will be located in Stockholm. The budget requirement is estimated at

138. 'Proposal for a Regulation of the European Parliament and of the Council Establishing a European Centre [for Disease Prevention and Control]', Commission of the European Communities, COM(2003) 441 final, 2 September 2003.

139. Ibid, p. 3.

140. Ibid, p. 38.

€48 million for the first three years of operation,[141] after which the Commission will draft a report on the implementation and effectiveness of the Centre, including proposals for changes to or extension of its activities.

With respect to the ECPF, there have been several suggestions for its creation. For example, Michael Barnier, the former Commissioner for Regional Policy and Chair of the Convention's Working Group VIII on Defence, has called for the creation of an ECPF that would be coordinated at the intergovernmental level post-2006. According to the proposal, the main focus for the force would be to fight natural disasters.[142] In the aftermath of the *Prestige* oil-tanker spill, the European Parliament called for 'a European civil protection force capable of responding to natural and industrial disasters, to create a legal framework for European responses to disasters and to appoint a Commissioner responsible'.[143] This call was reiterated after a heat wave cut across Europe in the summer of 2003.[144] It remains to be seen whether an ECPF becomes a reality.

A related issue is the creation of the post of EU coordinator for civil protection. The idea was put forward at the European Council of Ghent in the autumn of 2001 and is still relevant today. However, ongoing discussions concerning the creation of a European Coordinator for Civil Protection within the Commission have not borne fruit. In the feedback received by the Greek presidency in February 2003, the majority of member states felt there was no need for such a coordinator. A clear perception was that it would provide little added value.

Given these measures, what are EU member states doing to protect themselves against potential CBR attacks? The next section considers measures taken at the member state level, placing particular emphasis on organisation, exercises and funding.

141. Regulation of the European Parliament and of the Council Establishing a European Centre [for Disease Prevention and Control], COM(2003) 441 final/2, Brussels, 16 September 2003. http://europa.eu.int/eurlex/en/com/pdf/2003/com2003_0441en01.pdf.

142. Honor Mahony, 'Barnier: Eurocorps needed to fight catastrophes', *European Voice*, 19 August 2003.

143. 'Safety at sea and measures to alleviate the effects of the Prestige disaster', European Parliament Resolution P5_TA(2002) 0629, December 2002.

144. European Parliament, Resolution P5_TA-PROV(2003) 0373, paragraph 11.

What means of responding to CBR events exist at the national level within the EU?

It is up to the individual EU member states to ensure adequate protection in the event of a CBR attack.[145] Specifically, it is up to each member state's first responders – local firemen, policemen and health personnel – to mobilise in the aftermath of an emergency. Their level of knowledge, training and equipment are key determinants for how well a response is executed.

The EU member states have varying levels of preparation and resources to handle a CBR event. Differences are a function of diverse perceptions of the threat, past experience with terrorism, resource allocation, geographic location, size and national organisation. However, while some are better prepared and coordinated than others, most member states are vulnerable to catastrophic events which may result in thousands of casualties. According to Patrick Vankerckhoven, coordinator of the MIC in Brussels, even the large countries do not have the proper resources to handle a major attack: 'You can have material allowing you to decontaminate 25 people per hour. But not 2,000 or 5,000 people.'[146] A recent study on European security reflects a similar view: 'it is widely accepted that a few hundred or, at most, a thousand CBR victims would overwhelm any nation's existing civilian capacity.'[147]

This chapter provides a general outline of how CBR response is organised within EU member states.[148] The chapter also lists some of the lessons learned from national CBR exercises.

National organisation

A CBR event is likely to involve a number of national ministries and departments within the member state(s) concerned. The actual configuration of the departments activated largely depends on the type of attack. Each EU member state has a civilian lead agency for

145. 'The responsibility for protecting the population, the environment and property against the consequences of CBRN threats lies primarily with the Member States', 'Programme to Improve Cooperation in the European Union for Preventing and Limiting the Consequences of Chemical, Biological, Radiological or Nuclear Terrorist Threats', Council of the European Union, 14627/02 Annex 1, 21 November 2002.

146. Thomas Fuller, 'Unified response to attack eludes Europe', *The International Herald Tribune,* 14 January 2003.

147. Germaine Acke, 'Are our biochem defences credible?', in Germaine Acke, Laurent Cohen-Tanugi, John Mroz, Mark Shulman et al., 'Fresh Perspectives on Europe's Security', *New Defence Agenda*, Brussels, Winter 2004, p. 8.

148. For practical purposes, an overview of the policies within each EU member state is not feasible. For those seeking further information, Annex 1 provides some additional details of measures taken at the national level.

coordinating civil protection at the national level. Examples range from Sweden's Emergency Management Agency (SEMA) to Germany's Federal Agency for Civil Protection. The lead agency typically falls under the Ministry of the Interior.

In the event of a CBR attack, actual containment efforts will most likely start at the local level. To a certain degree, all member states rely on an internal subsidiarity principle whereby local resources within a city, municipality or district take the initial responsibility for containing the effects on an attack. In most cases, this will translate to local firefighters and hazmat (hazardous materials) resources.

Should local resources be insufficient, or the effects of the attack spread beyond the confines of the local level, regional sources can be requested. Following this logic, national assets would be available once resources at the lower levels are exhausted or insufficient, or are requested through the appropriate channels. Requests are typically made up the chain of command either through the fire chief, police chief, mayors, prefects, or local government officials. In member states with a federal structure, requests may originate from the regional governments. For example in Germany, such requests would come through the individual *Länder*.

This formula places heavy demands on first responders. It also requires well-developed plans for communication and coordination. To facilitate such coordination, member states rely on multiple plans of action at the local, regional and national level. For example in Greece, the *Xenocrates* national plan is complemented by numerous plans at the regional and local level. In France, there are specific plans to prepare against different CBR contingencies. While its *Piratox* plan is geared towards chemical and biological incidents, the *Piratome* plan is designed to handle nuclear or radiological events.

If the plans are managed efficiently, they will add substantial value if a multi-agency response is required. However, they can also complicate effective coordination by introducing 'stovepipes', a situation in which one actor does not know what his counterpart will do during an emergency. The existence of multiple plans and procedures may also affect interactions between stakeholders – e.g. local and provincial emergency operation plans may not always conform to national plans. It is unclear what steps are being taken within all EU-25 member states to limit the potential for such stovepipes.

None the less, some countries have taken steps to facilitate collaboration across jurisdictions and organisations. For example in Italy, its roughly 30,000 firefighters are organised as a national corps. As a result, they can rapidly cross the country's regional (20) and provincial jurisdictions (101) in case of need. In Austria, the armed forces may provide domestic assistance in the case of CBR emergencies through their specialised NBC unit. Since the anthrax attacks in the United States in 2001, they have been deployed to respond to hoaxes perpetrated throughout the country.[149]

While the involvement of military personnel in CBR emergencies is possible in a number of EU member states, the process is typically not straightforward.[150] In many instances, it may take time to obtain the required political approval, and any military assets employed would at best be assigned to decontamination tasks. An issue of concern is the relationship between military commanders on the scene and the civilian incident commander who carries the overall responsibility. Several senior emergency responders have voiced uncertainty about how the civilian incident commander could best direct military personnel.[151] In addition to issues of chain of command, differing operating cultures pose potential stumbling blocks.

Preparedness and resource allocation levels vary from country to country. The following section briefly considers such variations with respect to national exercises and funding.

Exercises

In terms of CBR-specific simulation exercises, only a handful EU member states have carried out large-scale civilian exercises to test their first responders' capabilities. Among the most frequently cited examples are the simulations carried out in subway stations in London and Paris in 2003.

149. Discussion with Austrian military NBC personnel at the NATO Advanced Research Workshop on 'Catastrophic Terrorism and First Responders: Threats and Mitigation', Neuhausen-Stuttgart, Germany, 10-12 May 2004.

150. Most countries allow for some form of military involvement in case of a substantial internal event. Examples include Belgium, France, Finland, Greece, Italy, Portugal, Spain, Slovenia and the United Kingdom. Some countries, such as Denmark and Sweden, are not inclined to allow the use of active duty military forces within the domestic territory. The author has not been able to get information on the situation within all new EU member states.

151. Interviews with first responders at the NATO Advanced Research Workshop on 'Catastrophic Terrorism and First Responders: Threats and Mitigation', Neuhausen-Stuttgart, Germany, 10-12 May 2004.

In early September 2003, Britain simulated a terrorist attack in the London Underground's Bank station to test its preparedness for a chemical attack on the underground system. Among the systems tested were collaboration protocols, decontamination measures and evacuation plans. The personnel used during the exercise included the London Fire Brigade, the Metropolitan Police Service, the City of London Police, British Transport Police and the London Ambulance Service. Similar exercises have been planned for the 2004-05, including a joint British/American exercise in 2005.

In France, an exercise was held in October 2003 to simulate a chemical attack on the Métro. Specifically, a mock nerve gas attack was staged at a large Métro/RER station (Invalides). The exercise was the first in a series of exercises. In statements given to parliament and members of the press, the then Interior Minister Nicolas Sarkozy indicated that 50 such exercises were to be carried out in 2004.[152]

Among the new EU member states, Slovenia carried out a national exercise in February 2004. Dubbed *New Horizon*, the exercise involved all main emergency response entities. The exercise simulated a 'dirty bomb' being found by customs officials in a van. After disposing of the bomb, responders cleared and secured evidence in the apartment building where the RDD device had been produced.

In some EU member states, CBR-related exercises have been kept low profile to minimise local concern (e.g. in Germany). In other countries (e.g. Greece), upcoming international events have forced authorities to undertake publicised exercises. However, many EU member states have not carried out large-scale CBR simulation exercises within their national jurisdictions. The reasons for this are multiple. In some cases, the costs associated with a large-scale exercise are viewed as prohibitive in relation to the likelihood of an attack. In other cases, the emphasis is placed on carrying out small-scale exercises to test specific tools – such as equipment or communication capabilities – at the local or regional level. Other countries are currently in the process of planning CBR-related exercises (e.g. Sweden for September 2004). Several countries have focused their efforts on bilateral or multilateral exercises.[153]

152. 'Paris simulates attack on Metro and plans drills in other cities', *International Herald Tribune*, 24 October 2003, p. 2.

153. These include NATO exercises with a CBRN dimension such as *Bogorodsk 2002* (Russian Federation) and *Dacia 2003* (Romania).

Unfortunately, the differences in approaches and exercise levels have implications for preparedness across Europe, since they affect member states' capabilities to collaborate across borders when necessary.

Lessons learned from recent exercises

Several lessons were learned at the conclusion of the exercises carried out by the United Kingdom and France in 2003. Those publicly available are briefly summarised below. While these lessons are not generalisable to other EU member states, they can serve as interesting case studies for member states and policy-makers concerned with preparations against potential CBR attacks. They suggest the types of challenges facing member states as they take steps to respond effectively.

Lessons from the United Kingdom

Several hundred emergency personnel were involved in the 7 September 2003 exercise carried out at London's Bank underground station. Among the key lessons learned from the operation were:

- *Additional work is needed in the area of contingency planning.* Alternative plans need to be readily available as the situation on the ground changes. For example, for operations in challenging environments such as underground stations, emergency personnel need to give consideration to alternative rescue plans.
- *Communication systems need to be improved.* This is especially true for those wearing protective suits and working under difficult conditions;
- *Ambulance services need to be quicker.* With respect to ambulance services, evaluators noted that crews should have provided quicker assessments, care, and antidote deliveries to contaminated casualties.
- *Preparation and funding need to be boosted.* Particular emphasis was placed on the need for adequate responses in the event of a large-scale emergency. With respect to preparation, the ministerial lessons note that planners should not 'underestimate the number of people and specialist equipment required to respond to such emergencies'. [154]

154. 'Lessons learned from the Exercise', Ministerial lessons, 15 December2003; http://www.ukresilience.info/london-prepared/antiterrorism/exercise.htm.

Lessons from France

The *Piratox* exercise that took place in Paris at Invalides Métro station on 22-23 October 2003 included personnel working for the national rail network (SNCF), local firefighters (including units from neighbouring districts), and health services from SAMU (Service Ambulancier Médical d'Urgence). The key lessons from the exercise were:[155]

- *Evacuation processes needs to be improved.* Although there were a maximum of approximately 50 'casualties' and 300 emergency responders at any moment, it took over 50 minutes to evacuate the station's casualties. The gathering point for victims was not optimal and the decontamination lines were built slowly (90-120 minutes). As time is critical and evacuation represents a key stage, it needs to be done rapidly and efficiently.
- *Training in the use of specialised equipment is needed.* Certain personnel using highly specialised equipment had not had enough opportunity to train regularly with it – something that was evident during the exercise.
- *Materiel support needs to be improved.* During the initial stages of the exercise, the arrival times of equipment and materiel support were not 'optimal'. This may be partially explained by the difficulty of moving equipment rapidly through densely populated urban areas.
- *Information feedback loops need to be strengthened.* Certain personnel on the ground were not always kept abreast of events. For example, approximately 90 minutes after the analysis and recognition team had decontaminated the 'sarin', certain personnel were still operating under the guidelines used for persistent toxics (that linger), which are not the same for sarin.

Funding

With respect to CBR preparedness funding, it is difficult to compare CBR budgets across EU member states, for a variety of reasons. First, funding levels are frequently lumped into other budget expenditures related to civil protection – requiring specific calcula-

155. Christian Sommade, 'Piratox : encore beaucoup de travail . . .' *La Lettre Sentinel*, janvier 2004.

tions to estimate the proportion destined for CBR protection. Second, member states habitually use different methodologies to calculate their budget figures – further complicating the possibility of comparing figures across member states.

The existence of many entities at the national level receiving CBR-related funding (including the armed forces) from a variety of sources also makes it difficult to aggregate total funding levels. Finally, the data collection process is complicated by difficulties in identifying the appropriate authorities that maintain such data, language issues (some countries only provide information in their language) and missing data. In this study it proved impossible to identify funding levels destined for CBR protection across all EU-25 member states. Where figures have been collected, they are presented in Annex 1.

What is clear is that that funding varies greatly across the EU. For example in Poland, approximately 0.004 per cent of GDP (or roughly €7 million) was spent on civil defence in 2003.[156] The figure for 2004 is substantially greater, as zl45 million (about €10 million) will be spent on equipment and medical stocks for the prevention of civil disasters alone.[157] In Sweden, SEK166.8 million (€18.3 million) are foreseen for CBRN civil protection measures in 2005. The total provisioned 2005 civil defence budget is about €207 million.[158] In the case of Italy, nearly €1.5 billion is budgeted in 2004 for the Interior Ministry's Department of the Fire Brigade, Public Relief and Civil defence – covering public emergencies, firefighting and civil defence.

Lamentably, there exists no centralised database detailing comparable CBR-related expenditure across member states. Such a database would allow for comparisons both at the aggregate and per capita levels. Eurostat maintains figures on public order and safety but these greatly overestimate expenditures dedicated to CBR and civil protection. In addition, current data are not available for the new EU member states.[159] However, Eurostat's data provide some indication of the amounts spent on internal security. Overall, EU-15 expenditures for public order and safety were in the order of €148 billion in 2002.[160]

156. Information provided by the Polish Ministry for Foreign Affairs through its Embassy in Paris on 19 February 2004.

157. Ibid.

158. *Samhällets krisberedskap 2005 – planeringsunderlag*, Krisberedskapsmyndigheten, KBM dnr 0812/2003, Stockholm 2003.

159. I thank Norbert Mühlberger (European correspondent at Capital) for leading me to this source.

160. Using data for 2001 for countries with no data for 2002.

Table 4 : Public order and safety expenditures: EU-15 (2002)*

Country	Percentage of GDP	Aggregate expenditure (€million)
Belgium	1.6	4,109
Denmark	1.0	1,830
Germany	1.6	34,020
Greece	1.1	1,515
Spain**	2.1	13,980
France**	1.0	14,277
Ireland	1.5	1,881
Italy	1.9	24,345
Luxembourg	1.1	252
Netherlands	1.7	7,382
Austria	1.4	3,094
Portugal	2.0	3,094
Finland	1.4	1,968
Sweden	1.4	3,757
United Kingdom	2.1	34.140

Public order and safety expenditures include expenditures on police services, fire-protection services, law courts, prisons, R&D for public order and safety, and other expenditure categories not already included.
** Indicates most recent data available is for 2001
Source: Eurostat (release date 15 June 2004).

Given the findings in the previous two chapters, what measures should be considered at the EU and national level to enhance civil protection? The next section provides a general conclusion accompanied by policy recommendations.

Conclusion and policy recommendations

5

This chapter summarises the report's main findings. It also makes recommendations to enhance CBR preparedness at the EU level, as well as in individual member states.

A CBR attack represents a low probability but potentially high impact event. Due to the potential for large-scale ramifications, attention is required by both the EU and its individual member states. While the likelihood of a CBR attack remains low, risks may be increasing over time.[161] Recent attempts by non-state actors to acquire or use CBR weapons demonstrate two things: (1) a number of groups are interested in acquiring CBR weapons and (2) as yet, their capabilities are limited and do not appear to surpass the effects that can be achieved through conventional weapons. Because the challenges associated with the production, storage, and dissemination of CBR weapons are great, terrorists are likely to focus on low-risk/high-payoff opportunities such as targeting facilities that produce or transport CBR-related substances. This low-risk/high-payoff approach combines terrorists' expertise in conventional weapons with the devastating effects of releasing biological, chemical or radiological elements.

Over time, it is likely that terrorists will seek to acquire or steal CBR weapons. As a result, the EU and individual member states need to take the necessary steps to ensure adequate protection against these and other types of threats. The Council and the Commission are spearheading current measures, the more notable of which include the Community mechanism and the 2002 CBRN programme. These instruments are ambitious, but new, continued efforts are necessary to ensure that the EU continues in the right direction and that objectives are met. There is room for improvement in areas such as cross-pillar cooperation and EU-level exercises.

Within the individual EU member states, preparedness to deal with CBR attacks naturally varies from country to country. Differences are a function of the perception of the threat, past

161. For example, the 9/11 Commission stated in its 16 June 2004 report that al-Qaeda was 'working hard to strike again, most likely in the form of a chemical, radiological or biological attack', '9/11 Panel: Al Qaeda planned to highjack 10 planes'; CNN at http://www.cnn.com/2004/ALLPOLITICS/06/16/911.commission/index.html.

experiences with terrorism, resource allocation, geographic location, size and national organisation. However, in the case of a large-scale attack, few member states would be able to cope with its ramifications effectively. Ensuring that first responders are properly managed, equipped and trained will go a long way. Since many of the same tasks apply in a number of emergency situations, an 'all-hazards' approach should be encouraged. Likewise, plans at all levels need to be consistent and tested periodically to ensure adequate responses to a CBR event. While individual member states bear the main responsibility for ensuring homeland security, the EU as a whole has an important role to play. The following pages contain recommendation for improving measures and coordination at both the EU level and among member states.

Recommendations aimed at the EU level

1. Establish a coordinator for homeland security at the EU level

A coordinator for homeland security is needed to ensure consistent policies across the EU. Current efforts undertaken within the EU in areas such as counter-terrorism, critical infrastructure protection, border and transportation security, health and emergency response should be streamlined as much as possible. Tasks of the homeland security coordinator could include: ensuring coherent homeland security efforts across the EU pillars, facilitating systematic information exchanges within the EU and between EU and member state authorities, overseeing the implementation process of adopted measures, maintaining close contact with international organisations dealing with CBR issues (such as the WHO, IAEA and NATO), organising periodic EU-level exercises, and formulating a homeland security strategy to organise and mobilise future efforts.

To ensure close links with member states, the coordinator should report directly to the future EU Minister for Foreign Affairs and the General Affairs and External Relations Council (GAERC). At present, some of the responsibilities of the recently appointed anti-terrorist coordinator overlap with homeland security. However, since the focus is specifically on counter-terrorism and resources are limited, several dimensions of internal security –

including CBR protection – are not covered proactively. Adequate financial resources and manning should be made available to facilitate the work of the coordinator. The staff should be made up of seconded officials, policy analysts and experts. Such a mix would allow the EU to gauge the impact of potential attacks at the EU level more effectively

Although many member states are not amenable to the idea of a coordinator, the nature of the threat, the increasing likelihood of an attack that has serious ramifications, and the possibility that more than one EU member state is affected require that the question be considered carefully. As noted in the European Security Strategy, '[t]he most frightening scenario is one in which terrorist groups acquire weapons of mass destruction. In this event, a small group would be able to inflict damage on a scale previously possible only for States and armies.'[162]

2. *Formulate a homeland security strategy*

Even in the absence of a coordinator, it is essential that the EU eventually formulate a homeland security strategy. This would encourage European policy-makers to think strategically about priority areas and objectives – including ways in which the EU can complement measures taken at the national level. In addition, it would pave the way for a more effective use of current and future EU resources.

3. *Organise more exercises at the EU level*

Large-scale exercises need to be held more frequently at the EU level. The main exercise to date, EURATOX 2002, demonstrated a number of weaknesses in the areas of interoperability and communication between emergency response teams representing different EU member states. Interoperability is crucial in the case of a large-scale attack requiring the collaboration of several EU member states.

In the future, the EU should consider organising exercises that affect more than one EU member state. In addition to enhancing interoperability, they provide a good platform for sharing best practices in meeting challenges in the field. For example, during the EURATOX 2002 exercise, teams from different countries

162. Javier Solana, 'A secure Europe in a better world. European Security Strategy', document adopted at the European Council, Brussels, 12 December 2003.

demonstrated to each other their approaches for handling specific situations (such as repairing specific leaks). Such possibilities result in valuable lessons being learned.

4. Establish a centralised repository for CBR-related information

An EU-level repository is needed to facilitate the collection and dissemination of CBR-related information. At a minimum, such a CBR repository should focus on two aspects: lessons learned and procurement. A lessons learned repository would allow EU officials to collect, catalogue, analyse and disseminate best practices emerging from EU-level and national exercises. A procurement database, on the other hand, should streamline information on products, standards, certifications, grants and other equipment-related information pertaining to CBR products. An online source of information would give emergency responders, vendors, standards organisations, training facilities and grant makers across Europe the possibility to see what equipment exists on the market, whether it has been certified (and to what standard), the training needed to use such equipment, grants available to purchase such equipment and equipment retail prices.[163] As an added benefit, such a system should serve to stimulate the creation of public-private partnerships.

5. Establish an EU-level vaccination stockpile

In the event of a biological attack, the effects are likely to ripple across several EU member states. The outbreak of SARS in early 2003 provided a good example of how a contagious disease can spread rapidly across national borders. To prepare for a potential biological attack, the EU should consider maintaining an EU-level vaccination stockpile. The benefits of setting up such a stockpile range from economies of scale to guaranteed access to adequate vaccinations, serums and prophylactics.

Presently, EU member states have different levels of protection in the case of biological attack – something that may partially explain the secrecy surrounding national stockpiles. An assessment of the national stockpiles shows that member states have enough to provide a dose for every citizen or enough for one in thirty, depending on the agent used.[164] Thus, there are substantial

163. For a model procurement database see the Responder Knowledge Base maintained by the National Memorial Institute for the Prevention of Terrorism (MIPT) at http://www1.rkb.mipt.org/

164. 'Communication from the Commission to the Council and the European Parliament on co-operation in the EU on preparedness and response to biological and chemical agent attacks', Commission of the European Communities, COM(2003) 320 final p. 15.

variations in preparedness. According to the Commission, the aggregate total number of first-generation smallpox vaccines in the EU is in the range of 200 million doses.[165] The only authorised anthrax vaccine is not widely available.[166]

6. *Review CBR preparedness funding streams*

In 2003, funding available within the Community budget for civil protection purposes was €6.4 million.[167] In 2002, the amount was €7.5 million.[168] In the area of bio-preparedness, the European Commission allocated €2 million annually via its 2003-08 health programme.[169] These budgets tend to be fairly stable and cover several years, complicating rapid readjustments in case of need. Policy-makers may want to consider increasing current funding levels and ensure that funding streams can be adjusted quickly if necessary. One estimate puts the global cost of major disasters in the EU at €10-25 billion per year.[170]

In the United States, the Department of Homeland Security has increased the funding for first responder grants by 1,000 per cent since 9/11. On 17 September 2003, the US House and Senate conferees agreed on a $29.4 billion budget for the Department of Homeland Security in 2004. While the EU should not try to emulate the level of investment set in the United States, it should invest enough to support additional specialised manpower (for example at the CPU and Council Secretariat), to carry out periodic exercises and ensure adequate laboratory capabilities.

Recommendations for individual EU member states

7. *Pick the 'low-hanging fruit': go for low-cost, high-payoff actions*

Protecting the European homeland from CBR attacks can be done in many different ways. Typically, threat analyses at the national level facilitate the identification of several options for securing the national territory. Those options can then be prioritised to ensure adequate planning and strategic resource allocation. However, difficulties in gauging CBR threat levels and their respective probabilities make implementation of cost-effective measures challenging.

165. Ibid., p. 17.

166. Ibid.

167. Council of the European Union, doc. 9787/03, 26 May 2003, p. 6.

168. Council of the European Union, doc. 12159/02, 18 September 2002, p. 6.

169. It should be noted that there are additional funding streams outside the Community budget for civil protection.

170. Council of the European Union, doc. 8715/04, 22 April 2004.

Unfortunately, it is easy to spend large sums on acquiring a sense of security without substantially reducing risks or increasing response capabilities.

An effective approach is to 'pick the low-hanging fruit' or invest in areas where small contributions can achieve a large impact. For example, to enhance protection against chemical attacks, policy-makers are probably better off spending more money protecting installations that house toxic industrial chemicals (TICs) – or the means of transport used to carry such chemicals – than investing in protection measures against a VX attack (although the latter should not be entirely dismissed). Many chemical installations are not well protected. Many are in the vicinity of large cities or important railway hubs, which makes them attractive targets. The private companies that manage them may be unwilling or not encouraged to invest large sums to secure them against would-be attackers. In fact, they may not be aware of the risks posed to population nearby. As such, even limited investments, such as increasing the number of police patrols around certain installations or providing tax incentives for companies to enhance security, can yield important pay-offs.

Implementing already existing guidelines may also be an attractive option. For example, not all EU member states have implemented the IAEA's guidelines for the storage and usage of radioactive sources.[171]

8. *Test national plans through large-scale exercises and table-top simulations*

As mentioned previously, exercises are critical in preparing to counter a CBR attack. Thus far, few countries have engaged in national exercises to test their plans, and assess the readiness of hospitals and emergency medical services. Moreover, when domestic exercises are carried out, they tend to be limited and involve testing the equipment of first responders. While this is important, it fails to test a number of other elements. Examples of critical issues that require periodic attention include:

- Who is expected to do what in the event of a crisis? Do they have the resources to carry out their responsibilities?[172]
- Are there pre-existing vaccination policies in the event of a biological attack? Do they adequately take into account the potential for adverse reactions?

171. The IAEA has also published reports on radiation safety and transport. Two safety guides were published in 2002: Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Materials and Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material. The IAEA is also carrying out Transport Safety Appraisal Service (TranSAS) to gauge the implementation of transport regulations in different countries. Four countries (Brazil, UK, Panama and Turkey) were covered in 2002-03. See http://www.iaea.org/Publications/Reports/Anrep2002/radiation_safety.pdf. For current objectives of the IAEA to control radiation sources, see http://www-rasanet.iaea.org/programme/radiation-safety/source-security.htm#securingmaterials%20. The information highlights the major tasks in this area for 2004-05.

172. For more on this see Brian Jackson, John Baker, Susan Ridgely et al., *Safety Management in Disaster and Terrorism Response*, (Santa Monica, Calif.: RAND 2004).

- Do large cities (e.g. those with over 500,000 inhabitants) have an emergency preparedness plan to deal with a CBR event?
- Is there a coordinated approach for sharing things such as hospital beds or emergency medical crews in the event of a large-scale attack?
- Are people who live near facilities that manufacture, handle, store, or transport hazardous materials aware of how to respond in the event of an incident?
- Is there an information and media strategy for ensuring adequate information flows in the aftermath of a CBR event? A related issue concerns access levels by the media to areas affected by a CBR attack. For example, allowing media helicopters to hover in the vicinity of an area attacked by a radiological weapon may not be wise, as the helicopter could stir up air and dust particles carrying radioactive materials – effectively worsening the situation on the ground.
- What measures are planned in the event that communications systems break down in the aftermath of a CBR attack (either due to the attack itself or because of an overburdening of the system after the event)?
- Are national laboratories properly equipped to provide timely results of samples forwarded to them? Are laboratories adequately networked to allow rapid communication?

9. *Improve early warning capabilities*

The best defence against a CBR attack is to prevent it or to act rapidly in its aftermath to contain its effects. Policy-makers may want to invest in stand-off and point detection chemical and radiation sensors. These can be placed in strategic locations likely to be targeted (e.g. densely populated areas, areas of congregation, around important government buildings, locations that will host large–scale events, etc.) With respect to biological attacks, the tracking of medical data may help analysts to spot an outbreak of contagious disease.[173] With one or two days of advance warning before a full outbreak, affected countries would have substantially lower casualty rates.

In the aftermath of an event, CBR simulation models may serve to help first responders establish and shift response perimeters. Using real-time weather data and environmental conditions, such information may serve to limit the consequences of an attack.

173. Such a network is under construction in the United States. The CDC is leading a project that collects medical data in eight US cities. Among the elements to be tracked are doctor reports, emergency room visits, and sales of flu medicine. Source: William Broad and Judith Miller, 'New U.S. warning system to track bioterror attacks', *International Herald Tribune*, 28 January 2003, p. 3.

10. Test security levels at critical installations through 'red teaming'

'Red team' programmes should be considered in ordered to test security at certain critical locations such as nuclear power plants and factories handling highly toxic chemicals. A red team exercise, in which a team of individuals is tasked to infiltrate or attack a certain facility, would allow a better understanding of current vulnerabilities across different types of installations. If only a few installations can be subjected to such exercises, the lessons learned should be shared with other facilities to allow them to fill any gaps in their security policies. Red teaming programmes could also be tasked to come up with security challenges and threats likely to be faced by installations so that corrective measures may be considered.

11. Facilitate the maintenance of institutional knowledge

Lessons learned represent a vital component of enhancing homeland security. Adequate steps should be taken to ensure that such lessons are appropriately extracted from first responders and suitably maintained. The first responders handling a particular event may move on or be promoted to positions where their practical skills are no longer used or their expertise is not immediately available when needed. A national repository for lessons learned and best practices would therefore facilitate the maintenance of institutional knowledge. It could also serve as an interface for sharing lessons with other member states or for feeding input to a future EU-level repository (in line with recommendation number 4 for the EU).

12. Formulate strategies to handle potential mass panic

Even a small-scale CBR event could result in massive societal panic. There is therefore a need to formulate strategies for handling such scenarios. Such strategies may take on a variety of forms. They may, for instance, focus on how to manage the movement of hundreds or thousands of individuals as they flee the scene of an attack. The City of London has publicly acknowledged that it has devised such a plan through its Resilience Partnership Programme.

At a different level, health emergency personnel may request specific guidelines to stop the spread of infectious disease. In such circumstances, it would be helpful if there are a priori guidelines covering issues such as quarantine powers, mechanisms for giving public health officials the authority to order doctors to treat people, and to order people to accept treatment under threat of arrest if non-compliant.

Finally, there is value in informing the population at large what steps should be taken in the event of a CBR event. Guidelines should be simple and informative.[174] A comprehensive media strategy should be available and put in place.

174. For example, the RAND Corporation in the United States has released a quick guide for citizens on individual preparedness and response to a CBRN event. See Lynn E. Davis, Tom LaTourrette, David Mosher et al., *Individual Preparedness and Response to Chemical, Radiological, Nuclear, and Biological Terrorist Attacks* (Santa Monica, Calif.: RAND, 2003).

Civil protection organisation in EU member states

This annex provides an overview of civil protection organisation within the individual EU member states. For each country, information is provided on national structures, personnel and funding. In categories for which no information has been found, it is clearly indicated. For most countries, it has not been possible to provide information on the proportion of first responders with CBR-specific training. Likewise, figures on funding have not always been readily available.

This annex is by no means complete; it should be regarded an initial attempt to produce a publicly available database of civil protection within the EU-25.[1] To a large extent, it is based on information provided by the International Civil Defence Directory.

Needless to say, any error or omission is the author's responsibility alone.

1. Some data collected has not been included due to its sensitive nature.

AUSTRIA

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Overview

Austria's civil defence and civil protection tasks are detailed in its National Defence Plan. The plan includes 'precautionary action against natural or technical accidents, accidents in the chemical industry as well as accidents during the transport of hazardous goods or nuclear accidents.'[2] These are complemented by disaster relief and alerting plans targeted at federal, provincial, district and local authorities. Under current arrangements, the Federal Ministry of the Interior is in charge of internal public safety and security. However, Austria's nine federal provinces are responsible for disaster management at the regional level. The provinces are also responsible for establishing fire brigades and emergency service units. Except for the major cities, most fire brigades and rescue services are made up of volunteers.[3]

A disaster affecting more than one province does not automatically fall under federal competence – especially if the provinces affected can cope with the disaster. In cases where civil protection involves federal or provincial authorities, coordination is facilitated through the Federal Crisis Management Coordination Committee.

Among the tools at the disposal of Austrian authorities are:

- an Early Radiation Warning System consisting of detectors in

2. 'Austria', *International Civil Defence Directory, 2003*. The International Civil Defence Organisation (ICDO); accessed December 2003 at http://www.icdo.org/National%20structures/Austria.pdf.

3. Ibid.

4. 'Katastrophenschutz', *Öffentliche Sicherheit*, no. 11/12, November/December 2001; http://www.bmi.gv.at/oeffentlsicherheit/.

336 locations throughout the country;[4]
- a national early warning system consisting of approximately 7,400 sirens;[5]
- self-protection information services.

The Austrian Federal Army can be employed in the aftermath of an event, reporting to civilian authorities. The Army has CBRN experts, detection squads (nuclear and chemical), a decontamination squad, and personnel responsible for collecting and transporting samples. The Army can also assist during international disasters through its disaster relief unit (AFDRU – Austrian Forces Disaster Relief Unit). The unit consists of 250 personnel who are deployable within 8-12 hours. The unit can handle both detection and decontamination missions.[6]

Austria has a number of provincial civil protection schools as well as training centres that are run by relief organisations. Under the auspices of the Ministry of the Interior, a specialised school provides both basic and advanced civil protection training. Examples of courses taught include disaster relief, radiation protection and the transport of dangerous goods. The Army runs its NBC defence school in Korneuburg.

Personnel

Austria's first responders are made up of police, firefighters, medical personnel and volunteer organisations. Austria has no special civil protection units. As a result, volunteers make up the overwhelming part of the first responder community. In terms of personnel numbers, some notional figures are provided below:
- fire brigades: 300,000 (mostly volunteers);[7]
- Federal Police: 15,174;[8]
- Gendarmerie: 14,561;[9]
- COBRA (special anti-terror forces): 336;[10]
- AFDRU (Austrian Forces Disaster Relief Unit): 250;[11]
- rescue organisations: 60,000.[12]

No information has been found concerning the proportion of personnel who have specific training to handle CBR-related events. It is estimated that fourteen training days are provided on average to each volunteer per year.[13]

5. Ibid.

6. Presentation by Major Erwin Richter, Austrian Armed Forces, NATO Advanced Research Workshop in Neuhausen-Stuttgart on 10-12 May 2004.

7. Op. cit. in note 6.

8. 'Daten und Fakten 2002', Bundesministerium Für Inneres; http://www.bmi.gv.at/downloadarea/daten_fakten/Fakten_2002.pdf.

9. Ibid.

10. 'Sondereinheiten – 25 Jahre Cobra', Ministry of the Interior, Press Release, 27 June 2003; http://www.bmi.gv.at/.

11. Op. cit. in note 6.

12. Ibid.

13. Ibid.

Funding

Information not readily available.

BELGIUM

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Overview[14]

In Belgium, the General Directorate of Civil Defence within the Ministry of the Interior is responsible for civil defence. The Ministry of the Interior is also in charge of designing federal emergency plans and setting organisational and training standards for fire services. In 1988, Belgium established a Governmental Coordination and Crisis Centre (CGCCR) to ensure 24-hour operational readiness. It serves as a clearing house for information and coordinates entities responding to an event.

The municipalities are initially responsible for managing emergency situations. If resources or capabilities are insufficient at the local level, the mayor or chief of police or fire can request the assistance from the General Directorate of Civil Defence. The Ministry of the Interior can also request the assistance of the armed forces through the CGCCR.

Belgium has a Royal School of Civil Defence based in Grez-Doiceau. It provides training courses for operational and volunteer civil defence personnel. Each province in Belgium has a training centre for fire services.

Personnel[15]

The General Directorate of Civil Defence includes 120 staff at the federal level and 650 permanent agents in 6 operational units based

14. 'Belgium', op. cit. in note 2, pp. 2-3.

15. Ibid., p. 3.

in Liedekerke, Brasschaat, Crienée, Chlin, Neufchâteau and Jabbeke. An additional 1,500 volunteers can reinforce the permanent staff.

Concerning first responders, there are 250 fire services organised into ten 'rescue zones'. There are approximately 16,000 firemen, of whom 11,000 are volunteers. No specific information has been found on the proportion of CBR trained personnel.

Funding

A special budget of €7.4 million was approved by the Council of Ministers on 30 November 2001 to develop a plan to combat biological and chemical terrorism.[16]

16. Ibid.

CYPRUS

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Overview[17]

In Cyprus, the Council of Ministers is responsible for civil defence. The Minister of the Interior – on behalf of the Council of Ministers – bears overall accountability for the country's Civil Defence System. In the case of a large-scale disaster, the Council of Ministers or the Minister of the Interior may declare a 'State of Civil Defence' for 48 hours. This period may be extended with the approval of the House of Representatives. The Council of Ministers may also appoint a Central Civil Defence Council and the Minister of the Interior may appoint several District Civil Defence Councils (one for each district).

Personnel[18]

Civil defence is largely carried out by conscripts and volunteers who serve in units located in urban areas and in villages near the cease-fire line. Personnel receive training compatible with the work carried out by its four different divisions: First Aid, Telecommunications, Welfare, and Fire Fighting. The Cyprus Fire Service consists of approximately 650 full-time and 120 reserve firefighters.[19] No specific information has been found on the proportion of CBR trained personnel.

With respect to CBR threats, a response system for radiological emergencies has been set up. As of 2002, the system was operated

17. 'Cyprus', op. cit. in note 2, pp. 2-4.

18. Ibid.

19. A. Kleanthous, 'Cyprus Fire Service'; http://www.f-e-u.org/feu_cyprus.php.

by Nicosia's general hospital. There are plans to expand the system and incorporate it into a central information centre to be manned by civil defence personnel on a 24-hour basis.

Funding

Information not readily available.

CZECH REPUBLIC

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General Directorate of Fire Rescue Svc Dlabacov 26 160 01 PRAGUE 6 Telephone: (+420 2) 61438420/ 61438411 Facsimile: (+420 2) 61438421 www.mvcr.cz	State Office for Nuclear Safety Senová né námìstí 9 110 00 Praha 1 Telephone: (+420 2) 2162 4665, 2162 4666 Facsimile: (+420 2) 21624 420 E-mail: Ladislav.Bartak@sujb.cz Vlastimil.Duchacek@sujb.cz

Overview

At the national level, civil protection competencies fall under the Czech Ministry of the Interior. It is executed in practice by the General Directorate of the Fire Rescue Service (CFRS). The Regional Fire Rescue Services implement civil protection locally. Specifically, the regional fire brigades are responsible for 85 territorial sections at the district level.[20] Firefighters are responsible for radiological and hazardous materials incidents.[21]

With respect to training, all professional firefighters undergo CBR training, including specialised radiation defence and dangerous substances training. Practical training skills include detection, location, identification, neutralisation and transport skills.

In addition to CFRS assets, Army units may assist with domestic civil protection missions. The military rescue units are located in Rakovník, Kutná Hora, Jindrichuv Hradec, Bucovice and Olomouc. Among others, they can assist with chemical accidents or outflows of hazardous materials. [22]

Until 31 December 2004, the Czech Republic is the lead nation of the NATO CBRN Battalion, to which it has contributed 280 personnel.[23]

20. 'Czech Republic', op. cit. in note 2, pp. 2-3.

21. 'Survey of the career professional fire fighters in Europe', FEUCARE, Folie 46; http://www.feucare.org/ppt/cz/Seiten/Folie46.htm.

22. 'Czech Republic', op. cit. in note 2, p. 3.

23. Czech Ministry of Defence; http://www.army.cz/scripts/detail.php?pgid=103.

Personnel

The CFRS is divided into 14 autonomous departments that correspond with the regions. At the end of 2003, there were about 6,400 professional firefighters in the state service, 3,400 professional firefighters in enterprises, and 95,500 volunteer firefighters.[24] There are special teams which posses CBR equipment, although the General Directorate does not collect information on their numbers.[25]

With respect to equipment, besides specialised equipment carried by the CFRS, the Czech Republic possesses two mobile laboratories that are deployable within two hours. Located at the Crisis Centre of the State Office for Nuclear Safety, these can locate, identify and neutralise chemical, radiological and biological materials. One of them can transport dangerous material. Their equipment includes mass spectrometers, automatic detectors and collection sets.[26]

With respect to military units, Army assets include two radiation and chemical reconnaissance units (6 troops + HQ), an equipment and terrain decontamination unit (8 personnel + HQ), a person decontamination unit (10 soldiers + HQ), a special mobile anti-epidemic group (4 individuals), a stationary microbiological laboratory and a hospitalisation and isolation base. All units are should be deployable within 6-24 hours. Their equipment consists of special intervention vehicles, mobile laboratories, identification instruments and decontamination equipment.

Funding

Information not readily available.

24. *Statistical Yearbook 2003*, General Directorate of CFRS, Ministry of Interior; http://www.mvcr.cz/casopisy/ 112/2004/priloha/rocenka03.pdf.

25. Telephone interview with the General Directorate of CFRS, April 2004.

26. 'Central Alarm Plan', The Office of the Czech Republic Government; http://wtd.vlada.cz/files/rvk/brs/dokumenty/01_UPP_priloha_1_tab1.pdf.

DENMARK

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Overview

The Danish Emergency Management Agency (DEMA), an agency under the Ministry of Defence, is responsible for national rescue preparedness in Denmark. In Denmark, regional divisions of the national Rescue Preparedness Corps can be requested by public authorities in case of need.

DEMA also supervises municipal rescue services across Denmark's 275 Danish municipalities and is in charge of coordinating civil sector preparedness planning. Finally, as the Danish national safety authority, DEMA is responsible for Danish nuclear emergency preparedness.

DEMA consists of ten branches (seven rescue centres and three schools), which are located around the country. Each year, the rescue centres train conscripts for a three-month period (900 per year) or six-month period (500 per year) – providing them fire-fighting competency. The conscripts who are trained for six months also receive a complete rescue course, including hazardous material training. [27]

With respect to biological risks, the Danish National Centre for Biological Defence (NCBD) coordinates all activities against bioterrorism and is responsible for national biological preparedness. It has a 24/7 call centre and six emergency response teams. Among its tasks are detection, sampling and countering the effects of a biological attack.[28]

27. 'The Danish Emergency Management Agency', The Danish Emergency Management Agency website; http://www.beredskabsstyrelsen.dk/uk/pub/brs/02.html.

28. Center for Biologisk Beredskab; http://www.biobered-skab.dk/centret/ncbd.html.

Personnel

Denmark's national rescue force stands at 650, while the municipal rescue preparedness consists of 1,700 full-time members, 3,300 part-time members and 1,600 volunteers.[29] DEMA and its ten branches employ a staff of about 630. The NCDB has a staff of 35.

Denmark has about 6,500 firefighters, of which approximately 3,800 are part-time, 1,300 professional and 1,300 volunteers.[30] No specific information has been found on the proportion of CBR trained personnel.

Funding

The annual budget of the national rescue preparedness is around €55 million.[31] The 2003 budget of the NCDB was 15 million Danish kroner (about €2 million).[32]

29. 'Denmark', op. cit. in note 2, pp. 1-2.

30. Op. cit. in note 22.

31. 'Denmark', op. cit. in note 2, p. 3.

32. 'Årsberetning 2003', Center for Biologisk Beredskab/Statens Serum Institut, 17 February 2004; http://www.biobered-skab.dk/centret/CBB_beretning_2003.pdf.

ESTONIA

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Overview

The Ministry of the Interior carries overall responsibility for Estonian civil emergency planning (CEP). The Estonian Rescue Board, which is subordinate to the Ministry of the Interior, is responsible for civil protection. Among its functions are emergency planning, risk assessment, fire safety, and early warning and alerting service.[33] A Government Crisis Committee coordinates CEP cooperation between the different governmental departments in case of need. The Ministry of Social Affairs is responsible for civil protection issues relating to bioterror.

At the regional level, there are 15 counties and county governors directly responsible to the government vis-à-vis civil protection. The County Governor is the highest CEP authority at the regional level and chairperson of the County Civil Protection Committee. At the local level, there are 254 local governments. The local Government Council is the highest CEP authority.

Personnel

The Estonian Rescue Service contains 3,000 full-time and 400 part-time personnel, including 630 firefighting personnel. Three Military Rescue Companies are subordinated to the Estonian Rescue Board to enhance firefighting, rescue and explosive ordnance disposal capabilities.[34] No specific information has been found on the proportion of CBR trained personnel.

33. 'Overview of the Estonian Rescue Services', Estonian Rescue Board; http://www.rescue.ee/page.php?id=44.

34. Ibid.

Funding

The Rescue Board's annual budget for 2002 was approximately 450 million Estonian kroons (about €27 million). Eighty-six per cent of this budget was designated for operational activities.[35]

35. 'Estonia', op. cit. in note 2.

FINLAND

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Overview

In Finland, civil defence and rescue services fall under the Ministry of the Interior (Rescue Department). There are provincial rescue departments that are responsible for civil defence at that level. To facilitate cooperation between the different rescue services, each province is divided into cooperation districts headed by a district chief. The municipalities are responsible for rescue services at the local level.[36]

By 2006, an Emergency Response Centre Authority will be activated to manage rescue service operations, police resources, social services and health services across Finland (except those in the Helsinki region). Finland currently has a nationwide radiation monitoring network comprising about 300 automatic measuring stations. They provide 24-hour radiation surveillance on a continual basis. The network can give a situation picture of a radiation source within approximately fifteen minutes.[37]

The Finnish state is responsible for professional rescue services training, which is provided at the Emergency Services College in Kuopio.[38]

36. 'Authorities and Administration', Rescue Services Department, Ministry of the Interior; http://www.pelastustoimi.net/esite/esite_eng/index.html.

37. 'Radiation Monitoring', Rescue Services Department, Ministry of the Interior; http://www.pelastustoimi.net/esite/esite_eng/index.html.

38. 'Finland', op. cit. in note 2.

Personnel[39]

Civil defence personnel in Finland include the police, fire services, health authorities, radiation authorities, aviation authorities, the Frontier Guard and defence forces. Approximate personnel breakdowns are:

- rescue services: 4,600 ;
- professional firefighters: 4,800;
- part-time firefighters: 4,300;
- voluntary firefighters and rescue personnel: 11,000;
- police officers: 7,745;
- Frontier Guard;
- wartime civil defence: 90,000;
- Finnrescueforce (Finish task force for international rescue operations): 200 – the personnel in the Finnrescueforce are capable of assisting with chemical decontamination missions.

No specific information has been found on the proportion of CBR trained personnel.

Funding

Annual expenditures on state and municipal rescue services amount to about €270 million.[40] The Finnish National Public Health Institute recently invested €20,000 for biological warfare preparation research. An additional €840,000 was requested for the 2003 budget to develop further preventive measures.[41]

39. See web pages of the different agencies and the International Civil Defence Directory 2003.

40. 'Costs', Rescue Services Department, Ministry of the Interior; http://www.pelastustoimi.net/esite/esite_eng/index.html.

41. 'Nordic Countries work together to prepare for threat of smallpox', *Helsingin Sanomat*, 17 January 2003; http://www.helsinki-hs.net/news.asp?id=20030117IE2.

FRANCE

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Overview

In France, civil protection is primarily under the authority of the Ministry of the Interior. The Ministry's Directorate of Defence and Public Safety (DDSC) prepares and mobilises the national response structure and local rescue services in case of need.[42] The DDSC also contains the Inter-ministerial Operational Centre (COGIC) that ensures round-the-clock monitoring of large-scale rescue operations and coordinates the use of resources – public and private, local and national – in the event of a major incident.

At the field level, the COGIC relies on seven defence zones and their respective Inter-regional Centres (Paris, Lille, Rennes, Bordeaux, Marseilles, Lyon and Metz) and four Operational Logistics Establishments (ESOLs) to provide logistical and material support. The prefect is responsible for the distribution of aid and rescue, and can also set in motion the ORSEC emergency plans – which include guidelines to combat major risks and disasters.

The Vigipirate plan, initiated in 1978, allows for the mobilisation of police and military personnel (soldiers (including paratroopers) and gendarmes). The plan consists of two stages: simple and reinforced. Under the reinforced version, the armed forces can be mobilised. Since the beginning of the Gulf War in 1991, France has keep the Vigipirate simple plan activated.

42. International Civil Defence Organisation, 'International Civil Defence Directory 2003'; http://www.icdo.org/intdirb.htm.

In terms of CBR, the Piratox plan is aimed at chemical and biological incidents, while Piratome is designed for nuclear and radiological events. In the aftermath of 11 September, a specific plan (Biotox) was formulated to deal with biological incidents. Among its key objectives are: [43]

- *prevention of risks* – e.g. securing 'sensitive' stock areas and production circuits;
- *supervision and alerts* – e.g. enhancing cooperation between civilian and military teams against biological risks;
- *intervention in case of crisis* – e.g. reinforcing potential intensive care arrangements, preventing transmission in contamination areas and ensuring the availability of emergency products;
- *development of vaccines and antidotes*;
- *reinforcement of European cooperation*.

Personnel

In terms of personnel, France has a range of different personnel at its disposal (including military units). These include a mixture of firefighters, police officers, gendarmes and other health emergency personnel (such as SAMU and SMUR). Their approximate numerical breakdown is:[44]

- firefighters: 240,000 (15 per cent professionals; 85 per cent volunteers);
- police officers: 130,000;
- gendarmes: 97,000;
- Red Cross: 30,000;
- Intervention and Guidance Units for Civil Protection (UIISC): 1,500 soldiers (reinforcing local authorities in cases of grave accidents and extreme emergencies).

Funding

Measures against CBR(N) attacks by non-state actors are primarily funded by the Ministries of the Interior, Defence and Health. It has not been possible to confirm a total aggregate figure. As an indication, however, within the Ministry of Defence, estimated CBRN funding for the period 2003-08 is approximately €52 million.[45]

43. Intervention de Bernard Kouchner Ministre délégué à la Santé, *Presentation to the press of the Biotox plan*, 5 October 2001; . *La Sécurité intérieure: le Plan Biotox*, 2 November 2001; www.vie-publique.fr/dossier_polpublic/securite_interieure/chronologie/biotox.shtlm.

44. Verena Wohlleben, 'Civil Protection, a General Overview,' NATO Parliamentary Assembly Committee Report, 2003, 143 CC 03 E.

45. Guy Teissier, 'Rapport relatif à la loi de programmation militaire 2003-08'; http://recherche.assemblee-nationale.fr, 25 November 2002.

GERMANY

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Overview[46]

Disaster management in Germany is dictated by the 1949 Basic Law, which assigns administrative responsibility for civil protection in peacetime to the sixteen regional states (*Länder*). In time of war, civil protection becomes a federal government responsibility. At the request of the *Länder*, the federal government can provide special technical assistance and manpower in areas ranging from firefighting to CBRN protection. The assistance can also take the form of financing, training and equipment.

During an emergency event, the heads of district (*Kreis*) administrations become responsible for ensuring adequate assistance. At their disposal are emergency staff including officials from the regional administration, the municipal, regional and volunteer fire brigades, the Federal Technical Support Service (THW) and private relief organisations. The German Armed Forces can provide 'official assistance' at the request of *Länder* officials in the event of a major catastrophe or accident. The extent of such assistance is flexible.

In June 2002, the Federal Government developed a 'New Strategy for Protecting the Population of Germany' to increase overall preparedness in case of a large-scale emergency. The strategy calls for the joint management of risk scenarios that have implications at the national level. In addition, the strategy stresses the impor-

46. Adapted from op. cit. in note 44 and the *International Civil Defence Directory 2003*.

tance of improving coordination levels between existing resources for emergency response. Following up on the strategy, a number of practical steps have been implemented, including:

- the establishment of a network in May 2002 linking the different emergency information systems into a joint German preparedness information system (deNIS);[47]
- the creation of a Coordination Centre for Large-Scale Emergencies (GMLZ) in the autumn of 2002 whose objectives are to continually monitor and evaluate the national and international civil security situation, serve as a permanent centre for resource management, direct the deployment of volunteers and oversee the distribution of material aid;
- the Federal Government recently set up a new Federal Office for Civil Protection and Emergency Response (BKK). Its main function is to serve as the central office for civil security preparedness.

Concerning the biological risk posed by smallpox, a three-scenario plan has been developed. It includes emergency inoculation centres as well as plans for special anti-CBR task forces. Under the plan's first scenario, assuming the absence of smallpox in the country, no vaccinations are to be conducted. There are current discussions on whether a small number of emergency staff should be inoculated. Under the second scenario – the presence of a confirmed smallpox case outside German territory – medical, rescue service and police personnel are to be vaccinated. In the third scenario – a smallpox case inside Germany – authorities would proceed with ring vaccinations around the area of the confirmed case. Vaccinations could encompass entire cities and could potentially be conducted nationwide.[48]

The Ministry of the Interior is currently revising equipment requirements for the emergency services, aiming to upgrade them in the near future to better position them to meet evolving threat scenarios.[49] Among recent acquisitions are 650 civil protection vehicles to the *Länder* authorities. Of these, 367 are equipped with state-of-the-art CBR detection capabilities.[50]

47. Deutsches Notfallvorsorge-Informationssystem (deNIS); http://www.denis.bund.de/.

48. 'Pockenimpfung: Was genau geschieht im Moment?', *Oekosmos*, 4 March 2003; http://www.oekosmos.de/article/articleview/367/1/4/.

49. Zentralstelle fuer Zivilschutz; www.zivilschutz-online.de.

50. Otto Schily, 'Bevölkerungsschutz in Deutschland', Press Release, 6 February 2003; http://www.bmi.bund.de/dokumente/Pressemitteilung/ix_91509.htm.

Personnel[51]

Firefighters bear the main responsibility for dealing with chemical and radiological events in Germany. Their approximate numbers, together with those of other key stakeholders are:

- professional firefighters (in cities of over 100,000 inhabitants): 27,000;
- volunteer firefighters (nationwide): 1.3 million;
- industrial firefighters: 37,000;
- Federal Technical Support Service (THW): 74,000 (with 850 professionals);
- relief organisations: over 500,000 made up of:
  - Samaritans: 7,200;
  - St John's Ambulance Services: 31,000;
  - Hospitallers of Malta: 31,000;
  - German rescue service: 145,000;
  - Red Cross: 305,000.

No specific information has been found on the proportion of CBR trained personnel.

Funding

The Federal Technical Support Service (THW) – which provides emergency aid and restores civil infrastructure – has a yearly budget of around €230 million (2000).[52] According to Ministry of the Interior's budget plan, another €293 million were spent on terrorism prevention measures in 2003.[53] Other public agencies, such as the Federal Border Service (BGS), have seen their budgets rise, although it is unclear how much of the additional funding will be dedicated to civil defence and terrorism related activities.

51. Op. cit. in note 44.

52. See 'Technisches Hilfswerk'; http://www.thw.de/.

53. See Bundesministerium des Inneren, 'Haushalt 2003'.

GREECE

Contact information:	
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Overview[54]

Civil protection in Greece involves national, regional and local administrations. The main bodies at the national level are:

- the Government Council for Civil Protection;
- the General Secretariat for Civil Protection (GSCP);
- the Inter-Ministerial Coordination Body.

Chaired by the Minister of the Interior, the GSCP outlines civil protection policies and coordinates civil protection services at national, regional and local level. In the event of a regional or large-scale disaster, the Inter-Ministerial Coordination Body functions to provide coordination assistance. Greece has a national emergency plan for handling complex emergencies. Known as *Xenocrates*, the plan outlines emergency planning at the national level for twenty-two different types of disasters. The majority cover natural catastrophes although there are plans for 'technological risks' – including chemical and industrial accidents and nuclear emergencies. One scenario covers risks associated with an epidemic.

With respect to training, steps are being taken to ensure CBR security at the forthcoming Olympic Games. An exercise, code-named 'Blue Odyssey', was organised by the Government in early 2004 to simulate a nerve gas attack. It brought together officials

54. 'Greece', op. cit. in note 2.

from the police, coastguard, fire department, intelligence agencies, civil defence forces and other agencies.[55] The Greek government, with US assistance, will also install radiation detectors at seven sites across Greece. The detectors will be set up mainly at border crossings.[56] Special equipment will also be used to detect chemical or biological attacks.[57]

Personnel

No figures have been found concerning personnel strength for Greece. However, there is a large mobilisation of personnel to enhance security during the 2004 Summer Olympic Games. There will be around 50,000 security personnel and police assigned to protect the Olympics.

Funding

In total, the country has earmarked about €1.1 billion for security measures at the Olympics.

55. Reported by BBC on 9 February 2004; http://news.bbc.co.uk/2/hi/europe/3474529.stm.

56. For this and the following information concerning Greek preparations for the Olympics, see the *Guardian*, 16 January 2004 and the Athens 2004 online; http://www.athens2004.com/athens2004/.

57. Reported by BBC on 9 February 2004; http://news.bbc.co.uk/2/hi/europe/3474529.stm.

HUNGARY

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Overview[58]

In Hungary, civil defence falls under the responsibility of the Minister of the Interior, who manages civil defence through the Directorate General of Civil Defence – a professional planning, organising and supervising body for civil defence within the National Headquarters of Fire Service and Civil Defence. In addition to the Directorate, heads of ministries and national agencies work to develop consensus with the Minister of the Interior vis-à-vis special civil defence prescriptions falling under their scope of authority.

At the regional level, chairmen of capital and county public assemblies within their area of authority direct civil defence measures. Their authority covers the civilian organisations and citizens. At the local level, mayors direct, organise and control civil defence tasks in coordination with the regional authorities. Their authority covers civilian organisations and citizens.

Personnel

The members of the regional civil defence organisation are assigned by the mayor from a pool of citizens having a civil defence obligation. The percentage of citizens assigned to civil defence tasks is 1.5 per cent, and an additional 1 per cent may be mobilised in a short period.

58. 'Hungary', op. cit. in note 2.

Funding

Information not readily available.

IRELAND

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Overview[59]

The Ministry of Defence is the lead agency for civil defence in Ireland. Within the Ministry, a civil defence branch facilitates emergency relief and the provision of vital services through the local authorities. An Inter-Departmental Committee can provide monitoring and support services in the event of a large-scale emergency. It can also be used to coordinate and test emergency plans. Ireland has a national emergency plan that involves the three primary emergency services: the Garda, Health Board and Local Authority. The Irish Army is also available to assist in times of national emergencies.

Ireland has a Civil Defence school for training purposes. With respect to CBR, the government has set up an expert group to assess the threat posed by bioterrorism. One of the specific scenarios under consideration is the impact of a biological attack in Britain or the United States and its repercussions for Ireland.[60]

Personnel

Ireland has approximately 344 ambulances and 214 fire stations. There is no indication what proportion of firefighters, police or emergency personnel have CBR training. However, radiation monitoring equipment is available, as is protective gear. In terms of actual numbers, the breakdown is as follows:

59. 'Ireland', op. cit. in note 2.

60. 'Ireland "not prepared for smallpox outbreak" ', *Breaking News.ie*, 5 April 2002; http://archives.tcm.ie/breakingnews/2002/04/05/story45395.asp.

- police: 11,747 members of An Garda Síochána;[61]
- health services: 62,000;[62]
- firefighters: 3,330 (1,185 professional; 2,145 retained);
- civil defence: 6,000 (volunteer).

No specific information has been found on the proportion of CBR trained personnel.

Funding

The Department of Defence covers about 70 per cent of civil defence related expenditures at the local level through grants. Overall, the annual civil defence budget is roughly €4 million. The 2000 White Paper on Defence increased the expenditure for the civil defence budget by €635,000 per year.[63]

61. 'FAQs', Garda Siochana; http://www.garda.ie/angarda/faq.html.

62. Department of the Environment, Heritage and Local Government, Fire Services and Emergency Planning Section; http://www.environ.ie/DOEI/DOEIPol.nsf/wvNavView/fsaep?OpenDocument&Lang=en.

63. Civil Defence in Ireland; http://www.civildefence.ie/Defence/Defence.nsf/ContentByKey/PROY-56EDUZ-CD-p.

ITALY

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Overview

In Italy, civil protection is the domain of the Ministry of the Interior. Principal entities responsible for civil protection at the national level include the Department of the Fire Brigade, Public Relief and Civil Defence within the Ministry of the Interior and the Technical Inter-ministerial Commission for Civil Defence.[64]

Italy has a national emergency plan in the event of a CBR event. It details the types of agents that may be used during an attack and their potential impact. The plan also contains non-public information on specific measures to be taken at the local level, including operative and organisational measures.[65] The ISS (Istituto Superiore di Sanita – National Institute of Health) and ISPESL (Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro – National Institute of Occupational Safety and Prevention) have been designated as Support and Information Centres in the event of a CBRN event. The emergency plan is complemented by additional plans at the local (prefecture) level.

In the event of an emergency, primary responsibility falls on the local mayor (*Sindaco*). If the resources at the disposal of the *Sindaco*

64. Dipartimento dei Vigili del Fuoco, del soccorso pubblico e della difesa civile.

65. 'Piano Sanitario Nazionale 2003-2005', section on Bioterrorism; http://www.ministerosalute.it/resources/static/psn/documenti/relazione_illustrativa.pdf.

are insufficient, provincial resources, regional or national assets may be requested. Military assets can be used to assist with a large-scale emergency, including those with a CBR dimension. In the case of a CBR event, the role of the military is likely to be one of decontamination. The military personnel would be under the command of civilian authorities in such situations. Specifically, operational control would most likely be given to a fire commander through the regional prefect.

Italy has a network of 1,200 radiation monitoring stations across the country to facilitate the early detection of a radiological or nuclear event. It also has a security structure, known as the 'Centrale DC-75', which can be used nationally to coordinate civilian and military efforts, and internationally and in support of NATO operations.

Personnel

First responders in Italy are primarily made up of firefighters, emergency public service personnel and police (including the *Carabinieri*). The firefighters are broken down into a national corps, their numbers ranging between 35,000 and 38,000.[66] There are also firefighters who serve as volunteers, numbering approximately 4,400. There is an objective to increase their numbers to 5,000 within the next two years (2004-05).[67] No specific information has been found on the proportion of CBR trained personnel.

Italy also has a large pool of civil protection volunteers. There are some 3,000 organisations tied to civil protection to varying degrees, bringing the total number of potential volunteers to 1.3 million nationwide. Volunteers can be reimbursed by the Italian state for their services during an emergency and its aftermath.[68] Principal volunteer organisations include ANPAS (300,000 volunteers), CRI (250,000 volunteers), and PROCIV-ARCI ED ARCI (250,000 volunteers).

Italy has a permanent CBRN training programme for its firefighters.[69] Since 1999, it also has an NBC Defence School (Scuola Interforze per la Difesa Nucleare Biologica e Chimica). The school trains military and civilian personnel from the armed forces, personnel stemming from the military medical service and civil medical personnel.

66. http://old.lapadania.com/2003/gennaio/21/21012002p10a1.htm.

67. Ibid.

68. Ministry of the Interior; http://www.interno.it/sezione/attivita/sicurezza/protcivile/s_000000112.htm, http://www.interno.it/sezione/attivita/sicurezza/protcivile/s_000000113.htm.

69. 'Risultati conseguiti e nuovi obiettivi del Dipartimento dei Vigili del Fuoco del Soccorso Pubblico e della Difesa Civile' (pdf); http://www.vigilfuoco.it.

Funding

The Department of the Fire Brigade, Public Relief and Civil Defence within the Ministry of the Interior has a budget of about €1.5 billion for 2004. The fire service has a three-year budget for equipment totalling €60 million, translating to €20 million per year.

LATVIA

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Overview

Latvia's State Fire and Rescue Service, which falls under the Ministry of the Interior, manages domestic civil protection. Primary civil protection tasks include the provision of assistance to victims, ensuring economic stability in the event of an emergency, and enhancing preparedness. At the municipal level, the local chief of fire and rescue services is in charge of ensuring adequate civil protection in the event of an event. The chiefs at the local level report directly to the State Fire and Rescue Service. It is up to the municipal authorities – in collaboration with local structures of the SFRS – to work out plans for civil protection and defence.

In addition to SFRS and municipal assets, Home Guard units may assist with civil protection missions. In practical terms, mutual assistance agreements can be arranged between local Home Guard battalions and emergency response assets – primarily fire brigades and police departments. In the event of a large scale emergency, the State Emergency Operations Commission handles coordination tasks. Latvia also counts with a Crisis Control Centre that is associated with the State Chancery. One of its principal roles is to coordinate existing plans for preventing and responding to national emergencies.

Latvia has a Radiation Safety Centre that monitors for radioactive leaks and abnormalities through a number of automatic alarm monitoring stations. Supervised by the Ministry of

Environmental Protection and Regional Development, it was established in 2001.

Personnel

Information not readily available.

Funding

Information not readily available.

LITHUANIA

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Overview[70]

Civil protection in Lithuania is managed through the Civil Protection Department in the Ministry of National Defence. The Department administers and coordinates civil protection at all levels of government, including supporting services of the ministries, state and local authority institutions. It also prepares civil protection workplans for the management of emergencies, major accidents or natural disasters, and organises the training and education of emergency officers.

The Emergency Management Centres act as managing institutions for civil protection. They have been established in the ministries, governmental institutions, regional administrations and local municipalities.

Personnel

Information not readily available.

70. ‘Lithuania’, op. cit. in note 2.

Funding

In 2002, budget allocations for civil protection amounted to approximately 6 million Litas (approximately €1.5 million), of which 4 million were used for regular expenditures and 2 million for extraordinary expenses.[71]

71. International Civil Defence Organisation, *International Civil Defence Directory, 2003.*

LUXEMBOURG

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Overview[72]

In Luxembourg, the Minister of the Interior is responsible for disaster management and is assisted by the Director of the National Civil Defence Services. The Director heads the emergency staff command, which includes the community mayors, representatives of the police, the army and the department of civil engineering. Depending on the nature of a disaster, representatives and experts from other public bodies may also be included.

The Civil Defence Directorate recruits and trains the managers of the rescue units and supervises the training of volunteers working in different fields of civil defence. It also manages the national civil defence school and national civil defence support base, which is in charge of heavy and specialised equipment.

Personnel

Among Luxembourg's first responders are firefighters, police and other emergency personnel (e.g. SAMU units). Personnel figures include:

- first-aid, ambulance and rescue brigade: 2,300 volunteers;[73]
- fire service: 8,000 volunteers.[74]

No specific information has been found on the proportion of CBR trained personnel.

72. Adapted from the *International Civil Defence Directory, 2003*.

73. Ibid.

74. See European 1-1-2 Conference and Exhibition, Brussels, December 2003.

Funding

Information not readily available.

MALTA

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Overview

Malta's Civil Protection Division, which falls under the Ministry of the Interior, is responsible for handling CBR events. The Civil Protection Council supervises the coordination of civil protection tasks. The Council, which is chaired by the Minister of Justice, consists of several senior service members such as the Commissioner of Police, the Commander of the Armed Forces and the Director of Civil Protection. The Council may also establish advisory commissions to assist it in its functions.[75]

Some specialised equipment for handling CBR contingencies exists, although so far most of the preparations have remained at the research stage. A specific contingency report was drawn up recently but there was no action to implement the upgrading of resources.

75. 'Malta', op. cit. in note 2.

Personnel

Information not readily available.

Funding

Information not readily available.

NETHERLANDS

Contact information:	
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National Coordination Centre Ministry of Home Affairs Postbus 20011 2500 EA The Hague/ 'S-Gravenhage Telephone: (+31 70) 345 44 00 Facsimile: (+31 70) 361 44 64	Ministry of Housing, Spatial Planning & Environment Directorate-General for Environmental Protection Directorate for Chemicals, Waste, Radiation Protection / IPC 645 Radiation Protection, Nuclear & Biosafety Division Rijnstraat 8, P.O. Box 30945, 2500 GX The Hague Telephone: (+31 70) 339 4965 Facsimile: (+31 70) 339 1314

Overview[76]

In the Netherlands, civil protection is the responsibility of the Fire Services, Disaster Relief and Crisis Management Department in the Directorate-General for Public Order and Safety (DGOOV) of the Ministry for the Interior and Kingdom Relations (BZK). In practice, responsibility for disaster relief rests with local authorities. Regions receive financial support, the extra equipment needed and any additional infrastructure required from the national authorities in time of need.

Should an event affect more than one municipality, the Royal Commissioner of the province can issue orders directing operations and coordinate operational efforts across affected municipalities without infringing upon the responsibility of mayors. As soon as assistance is requested from other provinces or countries, the National Coordination Centre for Public Order and Safety in the BZK assumes a coordinating role. Requests for assistance from other countries are also handled via the National Coordination Centre.

In the third update to the Netherlands national action plan 'Combating International Terrorism' the government focuses on

76. 'Netherlands', op. cit. in note 2.

the protection of critical infrastructure and vulnerabilities of Dutch society.

Personnel

Among Dutch first responders are police, firefighting and military constabularies. Notional personnel figures are:

- firefighters: 26,000 (including 3,500 professionals)[77]
- 61 fire brigades distributed amongst 43 regional operational centres;
- police officers: 40,000;[78]
- city watchers: 4,000 (assist the Dutch police in supervising the public domain);
- Royal Netherlands Military Constabulary.

No specific information has been found on the proportion of CBR trained personnel.

Funding

In late 2003, the United States agreed to pay for radioactivity detectors at the port of Rotterdam (Europe's largest seaport) to facilitate the identification of unauthorised nuclear material. At a cost of €2.7 million, the system will scan a proportion of the roughly 6 million containers that pass through Rotterdam each year.[79]

77. Netherlands Institute for Fire Service and Disaster Management; http://www.nibra.nl/cms/show/id=45741.

78. Dutch Police Service, 'Policing in the Netherlands'.

79. 'Radioactivity scanners to be deployed at port', *International Herald Tribune*, 14 August 2003, p. 5.

POLAND

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Overview[80]

The Council of Ministers is responsible for maintaining public order and internal security at the national level in Poland. The Council includes several committees, among them the Emergency Management Committee (EMC). The main task of the EMC is to coordinate efforts aimed at mitigating, preparing for, responding to and recovering from all types of hazards. Each ministry is responsible for actions within its own area of competence. The Ministry of the Interior is directly responsible for the majority of emergency services.

At the regional level, the provinces are headed by representatives of the Council of Ministers. Their main tasks are to coordinate prevention efforts and assist lower levels of government if resources are inadequate. They have Emergency Response Teams and Regional Crisis Management Centres at their disposal. Responsibilities at the lower regional level (*powiat*) include protection of the population in events that exceed the capabilities of the local level. The *starosta* (head of authority at this level) has an Emergency Response Team and a Crisis Management Centre.

Responsibilities at municipal level (*gmina*) include fire protection, the maintenance of public order, the monitoring of threats, early warning systems, alarms and the coordination of rescue operations and evacuations. The mayor defines civil protection tasks for all institutions that are operational within the munici-

80. 'Poland', op. cit. in note 2.

pality. Businesses are responsible for developing and maintaining activities and training in order to meet the possible threat situations accounted for in the Mayor's Civil Defence Plan.

A laboratory for combating bioterrorist threats opened in Pulawy in 2002. It was created at the cost of €1 million for the needs of Poland and NATO, and will be used for the study of dangerous microbes, including anthrax, smallpox, plague and cholera. The laboratory was built with funds from the Committee for Scientific Research and the support of the United States.[81]

Personnel

Information not readily available.

Funding

In Poland, approximately 0.004 per cent of GDP (or roughly €7 million) was spent on civil defence in 2003.[82] The figure in 2004 is substantially greater, as 45 million Zloty alone (about €10 million) will be spent on equipment and medical stocks for the prevention of civil disasters.[83]

81. Newsletter from Poland, 'A Laboratory for Combating Bioterrorism opens', May 2002.

82. Information provided by the Polish Ministry for Foreign Affairs through its Embassy in Paris on 19 February 2004.

83 Ibid.

PORTUGAL

Contact information:	
Civil protection	*Radioactive materials transport*
National Service for Civil Protection Av. do Forte em Carnaxide 2799-512 CARNAXIDE Telephone: +351 21 4247100 Facsimile: +351 21 4247180 E-mail: snpcpor@snpc.pt	Ministério da Saúde Direcção-Geral de Saúde Alameda D. Afonso Henriques, 45 P-1056 Lisboa Codex Telephone: (+351 1) 847 5751 Facsimile: (+351 1) 847 6455

Overview[84]

The Ministry of the Interior is responsible for directing civil protection assets. Nationwide, the Portuguese civil protection system integrates the National Service for Civil Protection (SNPC), the Regional Service for Civil Protection and the Municipal Service for Civil Protection. In accordance with the Portuguese Administrative Organisation, Portugal has 18 districts with a SNPC delegation in each district. Regional responsibility for civil protection lies with the Presidents of the Azores and Madeira Autonomous Regions and the Governors of each of the 18 districts on the mainland.

At local level, responsibility rests with mayors. Emergency Operations Centres in Districts (CDOEPC) and Municipalities (CMOEPC) are activated every time a major accident or disaster takes place in their respective administrative areas. A National Emergency Operations Centre (CNOEPC) is activated by the SNPC if a major disaster cannot be solved by the means assigned to the Municipality or the District where it takes place. Coordination and control of the relief operations and logistics support is then provided at the national level.

84. 'Portugal', op. cit. in note 2.

Personnel

Information not readily available.

Funding

Information not readily available.

SLOVAK REPUBLIC

Contact information:	
Civil protection	*Radioactive materials transport*
Office of Civil Protection Ministry of Interior Drienova 22 82604 BRATISLAVA Telephone: (+421 2) 4341 1190/4341 0005 Facsimile: (+421 2) 2 4363 5142 E-mail: skcivpro@uco.sk http://www.uco.sk	Nuclear Regulatory Authority Bajkalská 27 P.O. Box 24, 820 07 Bratislava Telephone: (+421 2) 5342 1032 Facsimile: (+421 2) 5342 1015 The Ministry of Transport, Post and Telecommunication Námestie slobody 6 P.O. Box 100, 810 05 Bratislava Telephone: (+421 2) 5949 4111 Facsimile: (+421 2) 5244 2274

Overview

The Ministry of the Interior of the Slovak Republic is the central authority responsible for civil protection. Responding to the Ministry of the Interior, the Office of Civil Protection is the main body managing and ensuring the tasks of civil protection. The Office takes part in response operations, notification and warning of the population, and evacuation.

The Office of Civil Protection is also responsible in case of an accident at a nuclear energy facility involving the escape of radioactive substances.[85] The system allows automatic warning when critical values are exceeded and sounds an alarm. The monitoring system also uses gamma-spectrometric measurement of soil samples.[86] Additional support can be provided through the Slovak Headquarters For Radiation Monitoring Network (Institute For Preventive and Clinical Medicine in Bratislava).

At the local level, main responsibility falls with the district office. District offices ensure the warning and notification of the population and direct the emergency response, as these do not come under the competence of other public administrative bodies or legal entities and municipalities.[87] Environmental monitoring for the leakage of radioactive materials is carried out by the Office

85. 'Contribution of civil protection to the radiation monitoring of the territory', Office of Civil Protection of the Ministry of Interior of the Slovak Republic; http://www.uco.sk/ eng/col_prot.htm.

86. Ibid.

87. 'Slovakia', op. cit. in note 2.

of Civil Protection, which builds and runs three monitoring systems.

Personnel

The Fire Rescue Service has a special chemical and biological group (11 people) and basic equipment: vehicles, anti-chemical suits, chemical detectors and decontamination materials. They act in case of: accidents with leak of chemicals, suspect mail deliveries (anthrax), and misuse of toxic chemical substance. In addition, the Rescue Brigades of the Fire Rescue Service, a specialised unit, may also be deployed in the case of highly difficult CBR actions.[88]

Funding

Information not readily available.

88. Email from the Fire Rescue Service Directorate, Slovak Republic, May 2004.

SLOVENIA

Contact information:	
Civil protection	*Radioactive materials transport*
Administration for Civil Protection and Disaster Relief Ministry of Defence Kardeljeva ploscad 21 1000 LJUBLJANA Telephone: (+386 1) 471 3322 Facsimile: (+386 1) 431 8117 E-mail: urszr@pub.mo-rs.si Website: www.mo-rs.si/urszr	Ministry of Environment and Spatial Planning Slovenian Nuclear Safety Administration Vojkova 59, 1113 Ljubljana Telephone: (+386 1) 472 1100, 568 3539 Facsimile: (+386 1) 472 1199, 472 1198 Ministry of Health Health Inspectorate Parmova 33, 1000 Ljubljana Telephone: (+386 1) 280 3802, 280 3804 Facsimile: (+386 1) 280 3808

Overview[89]

The Ministry of Defence organises, develops and implements administrative and professional matters related to civil protection. There are two subordinate agencies responsible for Civil Emergency Planning:

- *the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief*, which is responsible for administrative and professional duties related to the system of protection against natural and other disasters; and
- *the Civil Defence Directorate*, which carries out tasks related to Civil Defence.

At the regional level, the Defence Ministry's organisational units are responsible for administrative and professional tasks related to civil protection. At the local level, the mayor is tasked with protection tasks in the event of natural or other disasters. In larger local communities, administrative and professional duties are carried out by local administration. In smaller communities,

89. 'Administration of the Republic of Slovenia for Civil Protection and Disaster Relief – ARSCPDR', http://www.sos112.si/urszr/eng/spripravljenost_nacrti.htm.

these duties are executed by advisers. One special service may carry out these duties for several small local communities.

Slovenia has protection and rescue plans for dealing with CBR disasters drawn up at local, regional and national levels. It also has multiple special rescue resources in the event of an accident involving corrosive agents:[90]

- the Jo ef Stefan Institute's mobile ecological laboratory;
- Maribor Health Protection Institute's mobile ecological laboratory;
- Civil Protection CBR protection units;
- Slovenian Army CBR protection unit.

Slovenia carried out a national exercise in February 2004 (*New Horizon*) to test its capabilities to respond to an RDD.

Personnel

No specific figures have been found on first responders. Concerning Slovenia's CBN capabilities, post-11 September, CBN units were established across all its regions. Each unit comprises 9 members who have received basic and advanced training for Civil Protection and Disaster Relief. The teams are equipped with CBN detection and protective equipment.[91] As early as December 2000, Slovenia held a nuclear emergency exercise (NEK-2000), in order to test emergency preparedness at local and state level. This exercise has been repeated annually.[92]

Funding

Money is raised from national and municipal budgets, insurance funds, and funds contributed by commercial companies, institutes and other organisations. Since 1999, about 11 per cent of the Ministry of Defence budget has gone towards civil protection and rescue.[93]

90. 'Administration of the Republic of Slovenia for Civil Protection and Disaster Relief – ARSCPDR'; http://www.sos112.si/urszr/eng/spripravljenost_sile.htm.

91. Slovenian Nuclear Safety Administration, Annual Reports.

92. Ibid.

93. 'Administration of the Republic of Slovenia for Civil Protection and Disaster Relief – ARSCPDR'; http://www/sos112.si/urszr/eng/spripravljenost_financiranje.htm.

SPAIN

Contact information:	
Civil protection	*Radioactive materials transport*
General Directorate for Civil Protection C / Quintiliano, 21 28002 MADRID Telephone: (+34 91) 537 33 00 Facsimile: (+34 91) 562 89 26	Ministerio de Fomento Comisión de Coordinación del Transporte de Mercancías Peligrosas Paseo de la Castellana 67 E-28071 Madrid Telephone: (+34 91) 597 5021 Facsimile: (+34 91) 597 5027 E-mail: piribas@mfom.es

Overview[94]

In Spain the Minister of the Interior is responsible for civil protection, including intervention in case of catastrophe, and for drawing up plans for intervention. The General Directorate for Civil Protection, located in the Interior Ministry, is the national body that develops and manages emergency intervention programmes.

A Basic Standard sets the criteria for coordination of civil defence plans for various levels of government (central, autonomous, local). Each administration can organise and manage its civil protection system with complete autonomy but must respect the principles of interterritorial complementarity, subsidiarity and solidarity. Thus, the local administration copes with an emergency first, with the autonomous community taking over in cases where the local administration is strained. The central authority plays a similar role for the autonomous community. However, in cases of national emergency, the national government may assume the general direction of relief operations immediately.

Although the Minister of the Interior has overall authority in civil protection matters, after 11 September 2001 the Ministry of Defence activated a pre-established operational preventive rapid-response plan to neutralise a potential chemical and biological

94. Adapted from the *International Civil Defence Directory, 2003*.

attack. Over 250 soldiers are assigned to the NBC units between Valencia, Burgos and Madrid.

Personnel[95]

Among Spain's first responders are firefighters, medical emergency personnel, police, paramilitary policy (Civil Guard) and volunteer organisation personnel. Some notional figures are:

- professional firefighters: 14,000
- 20 planes for firefighting;
- volunteer firefighters;
- National Police: 52,000 (force goal);
- Civil Guard (*Guardia Civil*): 73,000 (force goal);
- Red Cross/volunteers: 780,000.

No specific information has been found on the proportion of CBR trained personnel.

Funding

Information not readily available.

95. Information drawn from a number of web pages maintained by Spanish agencies.

SWEDEN

Contact information:	
Civil protection	*Radioactive materials transport*
Swedish Emergency Management Agency P.O. Box 599 SE-101 31 Stockholm Telephone: +46 (0)8 593 710 00 Facsimile: +46 (0)8 593 710 01 e-mail: kbm@krisberedskapsmyndigheten.se http://www.krisberedskapsmyndigheten.se	Swedish Radiation Protection Authority SE-17116 Stockholm Telephone: (+46 8) 729 7100 Facsimile: (+46 8) 729 7108 E-mail: ssi@ssi.se

Overview

In Sweden, the Ministry of Defence plays a coordinating role within the Government Offices in the event of a large-scale event. The Ministry of Defence is also responsible for limiting the consequences of radioactive fallout, floods and dambursts, as well as accidents involving chemicals and marine discharges of hazardous substances.[96]

The Swedish Emergency Management Agency (SEMA), established on 1 July 2002, is responsible for coordinating work on the preparedness of society to manage substantial emergencies.[97] Specifically, SEMA provides support to municipalities, county councils, county administrative boards and other authorities in their emergency management work. Although it has no operational responsibilities, SEMA is accountable for the coordination and strategic planning vis-à-vis CBR response. SEMA also presents proposals to the government with suggestions for the allocation of resources and distributes funds to authorities involved in emergency management operations.[98]

An emergency is typically dealt with at the municipal or local level. Only when a situation cannot be handled at the local level can regional and central bodies take charge of certain tasks. At regional level, the county administrative boards carry the responsibility for major peacetime emergencies.

96. Swedish Government Offices; www.regeringen.se.

97. Once operational, SEMA took over several tasks from the Swedish Agency for Civil Emergency Planning and the National Board of Psychological Defence.

98. Swedish Emergency Management Agency (*Krisberedskapsmyndigheten*); www.krisberedskapsmyndigheten.se.

Between 29 and 30 September 2004, Sweden will carry out a large-scale national exercise to test its CBR response capabilities. Dubbed *Samsö* 04, the exercise will simulate a terrorist attack using WMD agents that affect three Swedish regions simultaneously.[99]

Personnel

Sweden has a number of first responders. In terms of personnel, the following breakdown gives some notional figures for a number of categories:

- police: 22,708;[100]
- Coast Guard: 600;[101]
- Rescue Service Agency: 600;[102]
- firefighters: 6,000 (professional), 12,000 (part-time), 4,000 (volunteers), 2,000 (industrial/airport/military);[103]
- rescue personnel: 4,029.[104]

No specific information has been found on the proportion of CBR trained personnel.

Funding

In Sweden, €18.3 million (SEK166.8 million) are foreseen for CBRN civil protection measures in 2005. The total provisioned 2005 civil defence budget is about €207 million.[105]

99. Ibid.

100. See website of the Swedish Police; http://www.polisen.se.

101. See website of the Swedish Coast Guard; http://www.kbv.se/.

102. See website of the Swedish Rescue Service Agency; http://www.srv.se/funktioner/frameset/default.asp?om_id=73.

103. 'Survey of the career of professional fire-fighters in Europe', Sweden; http://www.feucare.org.

104. Swedish Rescue Services Agency; http://www.srv.se/funktioner/publish/doklager/dokB1-41.pdf.

105. *Samhällets krisberedskap 2005 – planeringsunderlag*. Krisberedskapsmyndigheten, KBM dnr 0812/2003, Stockholm 2003.

THE UNITED KINGDOM

Contact information:	
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Emergency Planning Division Home Office 50 Queen Anne's Gate LONDON SW1H 9AT Telephone: (+44 20) 7273 3212 Facsimile: (+44 20) 7273 3078 Email : Epd@homeoffice.gsi.gov.uk	Department for Transport, Local Government and the Regions Radioactive Materials Transport Division 76 Marsham Street London SW1P 4DR Telephone: (+44 20) 7944 5795, 7944 5768 Facsimile: (+44 20) 7944 2187 E-mail: ca@dft.gsi.gov.uk

Overview

In the United Kingdom, the Home Secretary is responsible for homeland security. In the event of a catastrophe, plans drawn up by the emergency services, local government, public and health services, those responsible for industrial installations and others are activated.

In 2001, a Civil Contingencies Secretariat (CCS) was created within the Cabinet Office. Besides taking on some of the former tasks of the Home Office, the CCS assesses and responds to emergencies as they arise. The Cabinet Office Briefing Room (COBR) and the Civil Contingencies Committee (CCC) can be used to coordinate response efforts.[106]

The Health Protection Agency (HPA) is a new national organisation for England and Wales, established on 1 April 2003. It is dedicated to protecting people's health and reducing the impact of infectious diseases, chemical hazards, poisons and radiation hazards.[107]

In the aftermath of the 11 September terrorist attacks, the British government launched the 'New Dimension' Project, to review fire and rescue services' preparedness against a potential terrorist threat. The Office of the Deputy Prime Minister (ODPM) oversees the programme. Under the programme, the Government has acquired 180 purpose-built decontamination units, each

106. Adapted from Verena Wohlleben, 'Civil Protection, a General Overview', and the *International Civil Defence Directory, 2003*.

107. The Health Protection Agency (HPA); http://www.hpa.org.uk/default.htm.

capable of handling some 200 people an hour. In addition it has procured 80 new response vehicles to transport the decontamination units, as well as 4,400 new gas-tight suits.[108]

In certain circumstances, the military can provide aid to the emergency services. The Ministry of Defence has set out the conditions under which military assistance can be provided, included financial aspects. Generally speaking, there are three broad categories delineating Military Aid to the Civil Community (MACC):[109]

- Category A: assistance to the civil authorities in handling an emergency such as a natural disaster or incident;
- Category B: short term assistance on special projects of substantial social value to the civil community;
- Category C: the full-time attachment of volunteers to social service organisations for specific time periods.[110]

It should be noted that 14 Civil Contingency Reaction Forces (CCRFs) were established in 2003 – each comprising up to 500 volunteers drawn from existing Reservists.[111]

With respect to small-scale radiation monitoring, the United Kingdom has set up a number of permanent screening machines in several port cities. Three systems were established during 2003 at Felixstowe, Dover and Southampton. A fourth system is likely to be set up on the French side of the Channel tunnel to monitor traffic in the tunnel. There also exist portable systems – transportable by vans – that can be used to check cargo in other ports and airports. The scanner cost has initially been estimated at £50 million (€75 million).[112]

The Home Office organises several large-scale exercises and between 12-15 tabletop/workshop exercises each year.

Personnel

Among British first responders are firefighters, medical emergency personnel and police. Some approximate figures are:

- firefighters in England and Wales: 325,000-350,000 (2002);[113]
- police officers in England and Wales: 129,600 (2002);[114]
- ambulance service: 26,000 (2000);[115]
  - emergency ambulance vehicles: 3,153;
  - helicopter ambulances: 14;
  - fixed wing ambulances: 6.

108. See ODPM, 'Public protection - Fire and Rescue Service better equipped to cope'.

109. MACC is only one of three strands of Military Aid to Civil Authorities. There also exists Military Aid to the Civil Power (used for the maintenance of law and order) and Military Aid to Other Government Departments (for work of national importance).

110. *Dealing with Disaster*, Third Edition, Civil Contingencies Secretariat, Cabinet Office.

111. Ibid.

112. Stewart Tendler, 'Customs to scan for dirty bombs', *The Times*, 14 May 2003, p. 17.

113. See report 'The future of the Fire Service: reducing risk, saving lives'.

114. See UK Police Information; http://www.police999.com/uk-info/.

115. See Ambulance Service Association, 'United Kingdom Survey 1999/2000'.

The police have access to a CBRN Training Centre at Winterbourne Gunner. As of early 2003, about 3,000 officers had received CBRN training at the Centre.[116]

All emergency services personnel in London have access to personal protective equipment (PPE) needed to carry out their respective tasks. In addition, the London Fire Brigade is able to obtain bulk delivery of 260 gas-tight suits in case of need.[117]

Funding

Funding within the United Kingdom comes from a variety of sources and is destined to many stakeholders. Some figures are presented below, providing some indication of both their size and use.

- Under a £5 million (€7 million) programme, the Department of Health has acquired 360 mobile decontamination units and 7,250 PPEs to allow first responders to treat people contaminated with CBR material.[118]
- £43 million (€64 million) from the Capital Modernisation Fund, plus an extra £13 million (€19 million) from ODPM has been provided for the Fire Service to provide a national mass decontamination capability. Procurement of the appropriate equipment is currently under way.[119]
- £16 million (€24 million) was allocated to the Department of Health in 2001/02 to provide medical countermeasures against CBRN agents and a further £80 million (€120 million) for 2002/03, including spending on extra vaccines and antibiotics.[120]
- Local authorities were allocated a specific Civil Defence grant of £19 million (€28 million) for 2002/03, a third more than for the previous year.[121]
- In the 2003 Budget an extra of £330 (€494 million) was announced for counter-terrorism measures.[122]

116. House of Commons Hansard Debates for 31 Mar 2003; http://www.parliament.the-stationery-office.co.uk/pa/cm200203/cmhansrd/vo030331/debtext/30331-04.htm.

117. 'Exercise at Bank Underground Station'; details of the exercise http://www.ukresilience.info/contingencies/exercise.htm.

118. See David Blunkett, 'Civil Contingency Planning to Deal with Terrorist Attack', 2003; available at http://www.homeoffice.gov.uk/docs/civilcontingencies.pdf.

119. Ibid.

120. Ibid.

121. Ibid.

122. Ibid.

Abbreviations

AFDRU	Austrian Forces Disaster Relief Unit
ANPAS	National Association of Public Assistance (Italy)
ARS	Acute Radiation Syndrome
BC	Biological and Chemical
BGS	Federal Border Control (Germany)
BICHAT	Biological and Chemical Attacks and Threats
BKK	Federal Office for Civil Protection and Emergency Response (Germany)
BTWC	Biological and Toxin Weapons Convention
BW	Biological Weapon(s)
BZK	Ministry for the Interior and Kingdom Relations (Netherlands)
CB	Chemical and Biological
CBR	Chemical, Biological and/or Radiological
CBRN	Chemical, Biological, Radiological and/or Nuclear
CBW	Chemical and Biological Weapons
CDC	Centres for Disease Control and Prevention
CDOEPC	Emergency Operations Centres (Portugal - district level)
CECIS	Common Emergency Communication and Information System
CEP	Civil Emergency Planning
CFRS	General Directorate of the Fire Rescue Service
CGCCR	Governmental Coordination and Crisis Centre
CIA	Central Intelligence Agency
CK	Cyanogen Chloride
CMOEPC	Emergency Operations Centres (Portugal - municipal level)
CNOEPC	National Emergency Operations Centre (Portugal)
COBRA	Special Anti-terror Forces (Austria)
COGIC	Inter-ministerial Operational Centre (France)
CPMP	Committee for Proprietary Medicinal Products
CPU	Civil Protection Unit
CRS	Cutaneous Radiation Syndrome
CWC	Chemical Weapons Convention
DDSC	Emergency Preparedness Directorate (France)
DEMA	Danish Emergency Management Agency
DGOOV	Directorate-General for Public Order and Safety (Netherlands)
DNA	Deoxyribonucleic Acid
DRD	Direct Reading Dosimeter
DTPA	Diethylenetriaminepentaacetate
EADRCC	Euro-Atlantic Disaster Response Coordination Centre

EADRU	Euro-Atlantic Disaster Relief Unit
EAPC	Euro-Atlantic Partnership Council
EAPCCT	European Association of Poison Control Centres and Clinical Toxicologists
ECDPC	European Centre for Disease Prevention and Control
ECPF	European Civil Protection Force
ECURIE	European Community Urgent Radiological Information Exchange
EEA	European Environment Agency
EMC	Emergency Management Committee (Poland)
EMEA	European Agency for the Evaluation of Medicinal Products
ESOL	Operational Logistics Establishments
ESRP	European Security Research Programme
EU	European Union
EURDEP	European Union Radiological Data Exchange Platform
EWRS	Early Warning and Response System on Communicable Diseases
GA	Tabun
GAERC	General Affairs and External Relations Council
GAO	General Accounting Office
GB	Sarin
GC	Gas Chromatography
GD	Soman
GE	Phosphonofluoridic acid
GF	Cyclohexyl Sarin
GIRP	European Association of Pharmaceutical Wholesalers
G-M	Geiger-Müller Counter
GMLZ	Coordination Centre for Large-Scale Emergencies (Germany)
GMO	Genetically Modified Organism
GSCP	General Secretariat for Civil Protection
HCN	Hydrogen Cyanide
HD	Sulphur Mustard
HSC	Health Security Committee
IAEA	International Atomic Energy Agency
ICDO	International Civil Defence Organisation
IMS	Ion Mobility Spectrometer
IPCS	International Programme on Chemical Safety
ISPESL	National Institute of Occupational Safety and Prevention (Italy)
ISS	Institute for Security Studies, National Institute of Health (Italy)

ITF	International Task Force
JRC	Joint Research Centre
KI	Potassium Iodide
L	Lewisite
MedISys	Medical Intelligence System
MIC	Monitoring and Information Centre
MS	Mass Spectrometry
NATO	North Atlantic Treaty Organisation
NCBD	National Centre for Biological Defence (Denmark)
OPCW	Organisation for the Prohibition of Chemical Weapons
ORSEC	Organisation de Secours (France)
PB	Prussian Blue
PID	Photo Ionisation Detectors
PROCIV	Civil Protection Working Party
RDD	Radiological Dispersal Device
R&D EG	R&D Expert Group
SAMU	Service Ambulancier Médical d'Urgence (France)
SARS	Severe Acute Respiratory Syndrome
SEMA	Swedish Emergency Management Agency
SFRS	State Fire and Rescue Service (Latvia)
SMUR	Emergency and Reanimation Mobile Service (France)
SNPC	National Service for Civil Protection (Portugal)
THW	Federal Technical Support Service (Germany)
TIC	Toxic Industrial Chemicals
TIM	Toxic Industrial Materials
TLD	Thermoluminescent Devices
UIISC	Intervention and Guidance Units for Civil Protection
UK	United Kingdom
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
US	United States
VX	Methylphosphonothioic Acid
WHO	World Health Organisation

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The Sarin attacks carried out by the Japanese cult Aum Shinrikyo in Matsumoto and Tokyo highlighted the threat posed by non-state actors equipped with non-conventional weapons. Although the number of casualties was limited, the attack signalled a cause for concern.

In 2001, the United States was struck by bioterrorism shortly after 11 September. Weapons-grade anthrax was distributed by post, killing five people, making 17 others ill, forcing evacuation of Capitol Hill, shutting down postal delivery, provoking widespread use of prophylactic antibiotics and damaging the economy. An already shocked nation discovered that it was vulnerable to a new kind of threat.

While the probability of a chemical, biological or radiological (CBR) attack on the European continent is low, the ramifications of such an attack could be high. Recent arrests in European countries suggest that the likelihood of a CBR attack may be increasing.

This *Chaillot Paper* analyses EU-wide activities in the area of chemical, biological or radiological protection. It provides an overview of the threats facing the EU, summarises policies and preparedness at both the national and EU levels, and offers numerous policy recommendations to increase preparedness across Europe.

This paper will be of interest to policy-makers and analysts concerned with issues related to European security and possible future terrorist uses of biological, chemical, and radiological agents.

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