

# 1. INTRODUCTION

## 1.1 Developments since the first edition

Thirty years have passed since the World Health Organization (WHO) published its 1970 report *Health aspects of chemical and biological weapons (I)*, and there have been significant changes during this period. On the negative side, there has been the large-scale use of both mustard gas and nerve gas in the the war between Iraq and the Islamic Republic of Iran; the reported use of these agents by the Iraqi Government against its own citizens, most conspicuously at Halabja in March 1988;<sup>1</sup> and the use of sarin on two occasions (in 1994 and 1995) by the Aum Shinrikyo religious cult in public places in Japan, including the Tokyo subway. The cult also made preparations, fortunately ineffective, to use biological weapons. The dissemination of anthrax spores through the United States postal system in 2001, killing five people, has now further increased fears of bioterrorism. On the positive side, the Biological Weapons Convention and the Chemical Weapons Convention came into force in 1975 and 1997, respectively, and the Organisation for the Prohibition of Chemical Weapons (OPCW) has started its work of supervising the destruction of chemical-weapon stocks and factories, including those of the Russian Federation and the United States, and monitoring the world's chemical industry to prevent future misuse. From large populations of Europe and Asia, therefore, have now been lifted the immense biological and chemical threats that existed during the Cold War, when there were large active stockpiles of chemical weapons and active preparations for continent-wide biological warfare. These and other developments, both technical and political, over this period, led to a need for a review. This second edition is the result.

Technically, there has been further development along already identified lines rather than totally new concepts. The most important agents of biological and chemical warfare still include some of those

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<sup>1</sup> Statement by the Secretary-General of the United Nations to the General Assembly on 12 October 1998, document A/C.1/53/PV.3, 3–5.

listed in the 1970 edition. There have been rumours of nerve gases of greater power than VX or Vx, but the most important development in chemical weapons has been the “binary munition”, in which the final stage of synthesis of the agent from precursors is carried out in the bomb, shell or warhead immediately before or during delivery to the target. As for biological weapons, the genetic modification techniques foreshadowed in 1972 by the first laboratory-made “recombinant” DNA, as well as other developments in molecular biology, seem to offer possibilities for producing new biological-warfare agents. The accessibility of biological agents on a militarily significant scale has been substantially increased by advances in industrial microbiology and its greater use throughout the world.

The year 1970 was a watershed in international legal attempts to deal with the problem of biological and chemical weapons. Following the public renunciation of bioweapons by the United States in 1969, the multilateral conference on disarmament in Geneva, then called the Conference of the Committee on Disarmament, decided to consider biological and chemical weapons separately; these had previously been considered together, as in the 1925 Geneva Protocol prohibiting their use. The Conference thereupon started work on a convention banning the development, production and stockpiling of biological weapons, leaving consideration of a counterpart treaty on chemical weapons for later. The resultant Biological and Toxin Weapons Convention (BWC) was opened for signature in 1972 and entered into force three years later. Concerns about the continuing threat of biological warfare, accentuated by revelations during the early 1990s about bioweapons programmes in the former Soviet Union and in Iraq, led the States Parties to establish an ad hoc group mandated to negotiate a protocol that would strengthen the BWC, particularly through mechanisms intended to ensure compliance, including verification. Work on the protocol was suspended in the latter part of 2001.

The Geneva disarmament conference intensified its efforts on the problem of chemical weapons in the 1980s, and submitted the complete draft of a chemical disarmament treaty to the United Nations General Assembly in 1992. In contrast to the biological treaty, the Convention

on the Prohibition of Chemical Weapons (CWC) contained elaborate provisions on verification, to be operated through a new international organization, OPCW, with its headquarters in The Hague. CWC was opened for signature in 1993 and entered into force four years later.

The threat of use of biological or chemical weapons by the armed forces of states has clearly changed since the 1970 report, and is now a particular concern in regions of the world where states have still not joined the two Conventions. In addition, the risk that non-state entities might use such weapons remains a possibility. Vigilance and preparedness to react effectively will therefore continue to be important, as will means of rapid response by the international community. This new edition is intended as a contribution to that effort.

## 1.2 Origin and purpose of the present report

The first edition originated in a request from the Secretary-General of the United Nations to the Director-General of the World Health Organization in January 1969 to cooperate with a group of experts then being established to prepare a report for the United Nations on biological and chemical weapons and the effects of their possible use. This report was duly completed and released in July 1969 (2). It drew from a submission by WHO prepared by a group of consultants appointed by the Director-General, including consultants from two nongovernmental organizations engaged in the study of the subject, namely Pugwash<sup>2</sup> and the Stockholm International Peace Research Institute (SIPRI).<sup>3</sup> Shortly afterwards, the Twenty-second World Health Assembly, in resolution WHA22.58, requested the Director-General to continue the work (5). The result, which expanded the original submission to the United Nations, became the 1970 WHO report.

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<sup>2</sup> The Pugwash Conferences on Science and World Affairs is an international organization of scientists, to which the Nobel Peace Prize was awarded in 1995: its interests have included, since the 1950s, matters of biological and chemical warfare (3).

<sup>3</sup> SIPRI, funded by the Swedish Parliament, was then working, in consultation with Pugwash, on its six-volume study of the historical, technical, military, legal and political aspects of biological and chemical warfare armament and disarmament (4).

Since then, WHO has taken steps to keep itself informed of relevant developments. At the Fortieth World Health Assembly in 1987, the subject of chemical warfare was raised and referred to the Executive Board, which, at its eighty-first session in January 1988, noted a report by the Director-General entitled *Effects on health of chemical weapons*, based on a study updating parts of the 1970 report (6). Information on the health effects of chemical weapons and the availability of such information was then reviewed by a Working Group on 7–9 February 1989 (7).

In view of the need to be able to respond under Article 2(d) of the WHO Constitution to emergencies that might be caused by biological weapons, contacts were made by WHO towards the end of 1990 with the Swiss Federal Department of Foreign Affairs. There was also concern at that time about unpreparedness to respond to the consequences of any attack that might be made with weapons of mass destruction, and especially bioweapons, on civilians during military operations in Kuwait. This led to collaboration between WHO and Swiss Humanitarian Aid of the Federal Department of Foreign Affairs, Switzerland, and the consequent establishment of Task Force Scorpio, a team of appropriately equipped and trained specialists who could have been dispatched to an affected area by air ambulance at short notice (8). More generally, as the public has become more conscious of the possibility that biological or chemical agents may be released for hostile purposes, WHO has become concerned about the information on the subject available to the public health authorities of Member States. The Swiss Federal Department of Foreign Affairs has continued to provide support for WHO's efforts in the biological/chemical field, including financial support for the present publication.

In May 2001, the Fifty-fourth World Health Assembly, in resolution WHA54.14, requested the Director-General “to provide technical support to Member States for developing or strengthening preparedness and response activities against risks posed by biological agents, as an integral part of their emergency management programmes” (9). A year later, in resolution WHA55.16, the Assembly requested the Director-General “to continue to issue international guidance and technical information on recommended public health measures to

deal with the deliberate use of biological and chemical agents to cause harm” (10). This second edition has been published in response to these requests from the World Health Assembly.

The 1970 report considered biological and chemical weapons at the technical and policy levels. It was intended not only for public health and medical authorities but also for those concerned with emergency response to the suspected or actual use of such weapons. This second edition is intended for much the same readership: government policy-makers, public health authorities, health practitioners and related sectors, especially those concerned with risk- and consequence-management, and their specialist advisers. Not all of the material in the first edition has been included in the second, and some parts of it may still be of interest to specialists.

The present report also considers, in Chapter 5, the 1972 BWC and the 1993 CWC, to which the majority of WHO Member States are party. These two conventions and their national implementing legislation constitute a form of protection against biological and chemical weapons, and also a guide to international assistance if the weapons are nevertheless used.

### 1.3 Some working definitions

The definitions of biological and chemical weapons contained in the BWC and CWC are set out on pages 28–29 below. For the purposes of this report, however, *biological weapons* are taken to be those that achieve their intended target effects through the infectivity of disease-causing microorganisms and other such entities, including viruses, infectious nucleic acids and prions. Such weapons can be used to attack human beings, other animals or plants, but it is with human beings that the report is primarily concerned.

Some of these biological agents may owe their pathogenicity to toxic substances that they themselves generate. Such *toxins* can sometimes be isolated and used as weapons. Since they would then achieve their effects as a result not of infectivity but of toxicity, they fall within the

definition given below of chemical weapons, even though they are also biological weapons within the meaning of the BWC. Microorganisms are not the only life forms that can generate toxins. The BWC, where it refers to toxins, means toxic substances produced by any living organism, even when such substances are actually produced by other means, including chemical synthesis. The present report gives the same meaning to toxins as does the BWC, while recognizing that toxins are also covered by the CWC.

*Chemical weapons* are taken to be those weapons that are effective because of the toxicity of their active principles, i.e. their chemical action on life processes being capable of causing death, temporary incapacitation or permanent harm. They too can be used against human beings, other animals or plants, but again this report is focused on their effects in human beings. Weapons in which chemicals such as propellants, explosives, incendiaries or obscurants are the active principles are not regarded as chemical weapons, even though the chemicals may also have toxic effects. Only if producing such toxic effects is an intended purpose of the weapon can it be regarded as a chemical weapon. Some toxic chemicals, such as phosgene, hydrogen cyanide and tear gas, may be used both for civil purposes and for hostile purposes. In the latter case, they, too, are chemical weapons.

## 1.4 Structure

The main part of the report consists of six chapters. These are supported by seven annexes that contain more detailed technical information.

Chapters 2 and 3 describe how biological and chemical agents may endanger public health. Their purpose is to identify what is essential in any planning to avert or at least mitigate the consequences of the deliberate release of such agents.

In Chapter 4, standard principles of risk management are used to outline the steps that Member States may take to prepare themselves for the possibility that biological or chemical agents may be deliberately released with the aim of harming their population. The intention here

is to provide not the detailed guidance of an operational manual, but a review of the components of preparedness together with a guide to sources of more detailed information.

Chapter 5 considers the part that law, both national and international, can play in preparedness planning, including its potentially vital role in mobilizing international assistance, while Chapter 6 identifies available sources of such assistance.

## References

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3. Perry Robinson JP. The impact of Pugwash on the debates over chemical and biological weapons. In: De Cerreño ALC, Keynan A, eds. Scientific cooperation, state conflict: the role of scientists in mitigating international discord. *Annals of the New York Academy of Sciences*, 1998, 866:224–252.
4. Stockholm International Peace Research Institute. *The problem of chemical and biological warfare*. Vols. 1–6. Stockholm, Almqvist & Wicksell, 1971–1975.
5. Twenty-second World Health Assembly, resolution WHA22.58, 25 July 1969.
6. World Health Organization Executive Board, report EB81/27, 10 November 1987.
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8. Steffen R et al. Preparation for emergency relief after biological warfare. *Journal of Infection*, 1997, 34(2):127–132.
9. Fifty-fourth World Health Assembly, resolution WHA54.14, 21 May 2001.
10. Fifty-fifth World Health Assembly, resolution WHA55.16, 18 May 2002.