

SPECIAL COMMENT

Science has long served to advance humanity. In recent years, major discoveries in the life sciences and fantastic advances in biotechnology have become the stuff of daily news. New cures, a safer environment and better food sources are promised. There can be no doubt that the ever-increasing pace of such discoveries and advances—which go hand-in-hand with advances in information technology—will revolutionize our lives.

These same advances sit behind the articles of this *Disarmament Forum* by reminding us of an uncomfortable fact and a corresponding but as yet unanswered question. The fact is that all major advances and discoveries in science have, at some point, been turned to hostile use on a massive scale. The First World War demonstrated this in relation to chemistry and, obviously, the Second World War could not have culminated in the use of nuclear weapons without the prerequisite advances in nuclear physics. The question is: what are the implications for humanity if the advances in life sciences and biotechnology also are turned to hostile use? An additional consideration is that, as compared with the use of chemical or nuclear weapons, the effects of any future hostile use of the advances in life sciences could result in a contagious disease. Nobody can predict the outcome.

Use of chemical weapons has been rare; the use of biological weapons even rarer. But advances in life sciences and biotechnology may bring in an era that sees the use of new biological or chemical weapons; and some would fulfil the definitions of both biological and chemical agents given in the 1972 Biological and Toxin Weapons Convention (BTWC) and the 1993 Chemical Weapons Convention (CWC) respectively. New agents could be more easily designed, more specific in their effects or more difficult to detect. New ways to deliver “traditional” and new agents might be found in parallel with the means to overcome the targets’ natural or acquired defences. The user could carry out an attack in greater safety. In brief, many of the recognized disadvantages of chemical or biological weapons could be eliminated; new biological or chemical weapons would then become a much more attractive option for anyone contemplating their use.

Considerable confusion has been introduced (in my opinion, intentionally) by using the term “non-lethal” in relation to certain new weapons. There is talk of “non-lethal” biological and chemical weapons and their proponents have even gone so far as to advocate revision of the BTWC and CWC to accommodate these “non-lethal” alternatives. There is no evidence that any biological or chemical weapon is necessarily “lethal”; likewise, there is no evidence that any new agent would be “non-lethal”. One cannot talk about lethality without considering the dose received by the victim and the victim’s vulnerability. In other words, the proportion of people affected by a weapon who ultimately die (lethality) is the outcome of a context; it is not an inherent property of a weapon. Scientific research that results in “non-lethal” biological or chemical weapons will not serve to advance humanity. This is why such research is prohibited.

We have buried our collective head in the sand with regard to these issues; one reason is that they are very complex. They are so complex, I believe, that the means to address them will only be found by reverting to basics and considering two fundamental and obvious points. The first is that this whole subject is about preventing advances in life sciences and biotechnology from being used for poisoning or deliberate spread of infectious disease; by extrapolation, this lends itself to a preventive public health approach. Second, humanity is both the motivation for and beneficiary of such prevention. The links between these two facts are intuitive; however, to find practical and effective prevention and a meaningful dialogue at an international level that supports such prevention we need to look beyond our intuition.

When considering any complex issue related to weapons, the International Committee of the Red Cross (ICRC) refers to a scientifically valid model of armed violence and its effects. The model provides a standardized approach, uses public-health methodology, and applies to any use of any weapon in any context with any effect on the victims. The model stipulates that the design and development of weapons, their production, and their transfer are prerequisites for their use and so, in turn, for victims suffering the effects. The model then links the effects of any act of armed violence on the victim to certain necessary determinants of those effects—including factors relating to design, production, transfer and use of weapons. As applied to use of chemical or biological weapons, the determinants of whether victims suffer poisoning and deliberate spread of infectious disease are:

- the *vulnerability* of the victim (the potential to suffer poisoning or deliberate spread of infectious disease);
- the way the chemical or biological weapons are used (*use*);
- the potential number of weapons in use (corresponding to *production* and *transfer* of chemical or biological weapons); and
- the potential of the weapon to cause the effect (corresponding to *design* and *development* of the chemical or biological weapon).

Each determinant is necessary but not in itself sufficient to cause the effects. (In relation to “non-lethal” biological or chemical weapons, each determinant is necessary but not sufficient for the death—or survival—of affected people. This emphasizes the fact that lethality—or lack of it—is not an inherent property of a weapon.)

Any single measure that might prevent poisoning and deliberate spread of infectious disease is referable to one or more of the determinants. Examples are how public-health preparedness reduces *vulnerability*; the total prohibition and, at a national level, criminalization of poisoning and deliberate spread of disease aim to eliminate *use*; inspections, intelligence and customs regulations impact on *production* and *transfer* to would-be perpetrators; promoting notions of responsibility among scientists would address *design* and *development*. These measures overlap and integrate with states’ obligations under the BTWC and the CWC. It becomes obvious how each preventive measure is necessary but not in itself sufficient to minimize the risk of poisoning and the deliberate spread of infectious disease.

This approach provides the basis of what the ICRC is promoting as the “web of prevention”. Practical aspects of this are communicated in a series of imperatives: Recognize the risks! Maximize what you can do in your domain to reduce the risks! Listen to what others are doing! Coordinate your thinking and action! Individual scientists who fear this approach might bring greater regulation of their work are the most resistant to these messages. Many say “But we are not the problem. We do not make chemical or biological weapons!” The correct response is: “We know you are not the problem, but you are part of the solution because you have legal and professional responsibilities to prevent poisoning and deliberate spread of disease.” We must all learn to think and act within a web of prevention.

Apart from providing a framework for action, the web of prevention helps us to talk common sense about something that we seem to have difficulty approaching in common-sense terms. It serves to emphasize that minimizing the risks of the advances in life sciences and biotechnology being used for poisoning and deliberate spread of infectious disease is, by necessity, a multidisciplinary and collaborative endeavour. It is difficult to see how else to maximize the benefits to humanity of these advances and minimize the risk of their hostile use with potentially catastrophic results for humanity.

But what do we mean by humanity? For our purposes, the word humanity has two meanings. One meaning refers to the collective existence of all humans; the other implies an attitude, morality or sentiment of goodwill towards fellow humans. Some may think looking beyond this too academic. However, a closer consideration of both meanings of humanity and how they interact is important.

Humanity in the first sense implies more than just the species *Homo sapiens*. It implies collective living of humans and the security that this brings. However, to achieve this security, laws are enforced and nations are defended; this necessitates a capacity for armed violence in the hands of designated sections of our society and this capacity is, or should be, carefully regulated. In other words, a capacity for armed violence and regulation of this capacity are prerequisites for our successful collaborative existence. In this way, we see how international law, by avoiding costly armed confrontation between states, promotes humanity in the collective sense. If we accept our successful collective existence depends on a carefully regulated capacity for armed violence, we must ask why use of chemical or biological weapons is not part of this picture. The obvious answer is that poisoning and the deliberate spread of infectious disease have never been compatible with the notion of reasonable use of force within a society and in warfare have always been deemed abhorrent. That such weapons are totally prohibited by the BTWC and the CWC is both consequence and confirmation of this abhorrence. In other words, there is no acceptable use of chemical or biological weapons. (I accept a possible exception is the controlled and open-air use of lachrymatory agents in specific contexts, i.e. for riot control.) Finally, to emphasize the link between notions of humanity in the collective sense, both the BTWC and the CWC contain preambular paragraphs which read "Determined, for the sake of all mankind, to exclude completely the possibility of [use of chemical and biological weapons.]"

Humanity in the second sense—the spirit, sentiment or morality—is a cited source of international law. The one-page 1868 St Petersburg Declaration, which prohibited the use of exploding bullets, is the single parent of modern arms control (and also of many principles of international humanitarian law). The declaration, which was the outcome of a *military* commission, refers once to the "requirements of humanity" and twice to the "laws of humanity". It is abundantly clear that those drawing up this declaration believed that technical developments in weaponry should be accountable to humanity. The famous Martens clause originating in the 1899 Hague Peace Convention and articulated in the 1907 Hague Convention (IV) invokes "the laws of humanity, and the dictates of public conscience". Humanity, as the first principle of the International Red Cross and Red Crescent Movement, clearly refers to the spirit in which certain actions are undertaken; nevertheless, it remains an ambiguous concept. This second notion of humanity becomes more concrete if considered as the converse of inhumanity and there are few, if any, acts of inhumanity that do not ultimately involve use of, threat of or coercion by armed violence. (The definition of "crimes against humanity" in the 1998 Rome Statute of the International Criminal Court serves as evidence, although there is no indication of which humanity is being referred to in this category of crime. Perhaps it is both?) Whatever the case, would not most people working to ensure the total prohibition of biological or chemical weapons consider armed violence involving poisoning and deliberate spread of disease an act of inhumanity?

Enough of playing with words! These two notions of humanity are co-dependent. By this I mean an inherent morality or sentiment of goodwill towards fellow humans (including an abhorrence of inhumanity) is necessary for the positive collective existence that all humans aspire to. The co-dependence

of the two humanities makes it clear that humanity in a general sense is both a prerequisite for and is protected by international law. International law that regulates armed violence and so prevents some effects of armed violence is where the two senses of humanity ultimately fuse; this is epitomized in relation to the two principal conventions that prohibit poisoning and the deliberate spread of infectious disease. An inescapable conclusion is that the BTWC and the CWC are rooted deeply in humanity in both senses and are necessary for the future of humanity in the collective sense.

Preventing the use of advances in life sciences and biotechnology to facilitate poisoning and deliberate spread of infectious disease should be considered for what it is: a critically important issue for humanity and one that cannot be ignored for much longer. The web of prevention permits a common-sense dialogue and maximizes the potential of any single measure to reduce the risks to a minimum. However, the web of prevention will lack a vital strand if the politicians, diplomats, lawyers and scientists working on the BTWC and CWC do not feel accountable to humanity and adapt their beliefs and behaviour accordingly.

Dr Robin M. Coupland

Medical adviser on armed violence and the effects of weapons
Legal Division of the International Committee of the Red Cross

The opinions expressed are the author's own and do not represent the views or policy of the ICRC.