

Public perception and risk communication in regard to bioterrorism against animals and plants

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Summary

This paper examines the total international prohibition on the use of disease to attack humans, animals and plants, noting that in the past several countries had developed programmes for attacks on animals and plants as well as humans. Current activities undertaken by intergovernmental organisations – the World Health Organization (WHO), Food and Agricultural Organization (FAO) and World Organisation for Animal Health (OIE) – to counter the threat of attacks on humans, animals and plants are examined. Effective countermeasures to deliberate attacks need to be developed in harmony with existing measures to control natural or accidental outbreaks of disease. Finally the paper assesses the risk and the public perception of it, and considers what risk communication is needed and to whom. Clear mandates are needed for the FAO and OIE to be prepared to deal with outbreaks of disease, and with contamination of the food supply chain, whether accidental or intentional.

Keywords

Animal – Bioterrorism – Contamination – Deliberate outbreak – Disease outbreak – Food supply chain – Plant – Public perception – Risk – Risk communication.

Introduction

While much attention has been given internationally and nationally to the dangers of bioterrorism against humans, especially since the anthrax letters in the United States of America (USA) in October 2001, much less consideration has been given to the dangers of bioterrorism against animals and plants. This paper examines the total international prohibition on the use of disease to attack humans, animals or plants, and notes that prior to this total prohibition a number of countries had developed programmes for attacks on animals and plants as well as humans. The paper goes on to examine the current activities being undertaken by the intergovernmental organisations – the World Health Organization (WHO), Food and Agricultural Organization (FAO) and World Organisation for Animal Health (OIE) – to counter the threat of attacks on humans, animals and plants, and concludes that effective measures to counter deliberate attacks need to be developed alongside existing measures to control natural or accidental outbreaks of disease. Finally, the paper will assess the risk and the public perception of it, and consider what risk communication is needed and to whom. One

conclusion is that clear mandates are needed for both the FAO and OIE to be prepared to deal with outbreaks of disease and with contamination of the food supply chain, whether these are accidental or intentional.

Deliberate releases of disease to attack humans, animals and plants are totally prohibited by the Biological and Toxin Weapons Convention (BTWC) (12), which opened for signature in 1972 and entered into force in 1975. Currently, this has 155 States Parties and 16 Signatory States (14) who are bound by the obligations set out in Article I of the Convention:

‘Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

(1) microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;

(2) weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict’.

Successive review conferences of the BTWC have reaffirmed the comprehensiveness of this prohibition and have made it explicitly clear that it applies to humans, animals and plants. For example, the Final Declaration (13) of the Fourth Review Conference in 1996 stated that:

‘The Conference reaffirms that the Convention prohibits the development, production, stockpiling, other acquisition or retention of microbial or other biological agents or toxins *harmful to plants and animals, as well as humans*, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes’ (emphasis added).

In addition to the prohibition, Article IV of the Convention requires each State Party to take any necessary measures within its territory or anywhere under its control to prohibit and prevent the activities proscribed by the Convention:

‘Each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in Article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere’.

In the United Kingdom (UK) such national measures were taken by the Biological Weapons Act 1974 (9) which used language very similar to that in Article I by stating that:

‘(1) no person shall develop, produce, stockpile, acquire or retain –

(a) any biological agent or toxin of a type and in a quantity that has no justification for prophylactic, protective or other peaceful purposes; or

(b) any weapon, equipment or means of delivery designed to use biological agents or toxins for hostile purposes or in armed conflict.

(2) In this section –

‘biological agent’ means any microbial or other biological agent; and

– ‘toxin’ means any toxin, whatever its origin or method of production.

(3) any person contravening this section shall be guilty of an offence and shall, on conviction on indictment, be liable to imprisonment for life’.

The Final Declaration of the Fourth Review Conference in 1996 stressed the importance of adopting national measures to prevent the use of biological or toxin weapons in terrorist or criminal activity:

‘The States Parties recognize the need to ensure, through the review and/or adoption of national measures, the effective fulfilment of their obligations under the Convention in order, inter alia, to exclude use of biological and toxin weapons in terrorist or criminal activity’.

Prior to the agreement of the BTWC in 1972, there were national biological weapons programmes that were based on anti-animal and anti-plant agents as well as anti-personnel agents (3, 8). However, national biological weapons programmes have been principally focused on the development of anti-personnel agents, with secondary attention given to anti-crop agents and even less to anti-animal agents. Anti-animal agents were considered in some of the earliest programmes, including biological sabotage in the First World War when it was argued by Germany that while anti-personnel use of such agents was prohibited, anti-animal use was probably not (14). Following the signature of the 1925 Geneva Protocol, to which many States Parties entered a reservation that they would no longer be bound by the Protocol should they be attacked with chemical or biological agents, the focus was on the means of retaliation in kind if chemical or biological agents were used against a State. It was such considerations that led the UK to develop its anthrax cattle-cakes, which would have been used against German cattle if Germany had used biological weapons against the UK. During and after the Second World War, the British biological weapons programme focused on developing anthrax as an anti-personnel weapon, although no stockpile of such weapons was ever produced and the stockpile of anthrax cattle-cakes was destroyed after the war (2). In the post-war years, the weapons programme in the USA focused on anti-personnel agents, as well as stockpiling but not weaponising three anti-crop agents: stem rust of wheat and rice blast. Although some attention was given to anti-animal agents, the USA does not appear to have selected or stockpiled any such agents (15). The Soviet Union programme is said to have studied anti-livestock agents including African swine fever, foot and mouth disease and rinderpest (1).

The biological warfare programmes in the UK and USA – of whatever type: anti-personnel, anti-plant or anti-animal – terminated in the mid-1950s and the late 1960s respectively, paving the way for the agreement of the BTWC, which entered into force in 1975. Although the Soviet Union continued its biological warfare programme for some decades, in 1992 President Yeltsin issued a decree terminating such activities. Consequently, by the 1990s, with the opening for signature in 1993 of the Chemical Weapons Convention (CWC) and its entry into force in 1997, there was total prohibition of both chemical and biological weapons.

The threats posed by chemical and biological weapons can usefully be considered as a spectrum (10) (Fig. 1).

Classical chemical weapons	Industrial pharmaceutical chemicals	Peptides and other bioregulators	Toxins	Genetically modified biological weapons	Traditional biological weapons
Cyanide Phosgene Mustard Nerve agents	Aerosols	Substance P Neurokinin A	Saxitoxin Ricin Botulinum toxin	Modified/tailored bacteria and viruses	Bacteria Viruses Rickettsia Anthrax Plague Tularaemia
← Chemical Weapons Convention →			← Biological and Toxin Weapons Convention →		
← Poison →			← Infect →		

Fig. 1
The comprehensive prohibition of the Chemical Weapons Convention and the Biological and Toxin Weapons Convention

Figure 1 shows clearly the overlap between the two Conventions in the mid-spectrum region. The CWC in its Article II stipulates that its prohibition of toxic chemicals includes ‘any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals’ (emphasis added). The CWC also, in Article VII on National Implementation Measures, requires that each State Party shall adopt the necessary measures to implement its obligations under the Convention. In particular, each State shall:

‘Prohibit natural and legal persons anywhere on its territory or in any other place under its jurisdiction as recognised by international law from undertaking any activity prohibited to a State Party under this Convention, including enacting penal legislation with respect to such activity’.

Consequently, although the BTWC and the CWC primarily address States Parties, the requirements for national implementation in both Conventions should ensure that all persons are prohibited and prevented from carrying out activities prohibited by the Convention – and thus provide a legal framework that prohibits acts by sub-State actors such as criminals or terrorists.

Bioterrorism concerns

Although the deliberate releases of biological agents is acknowledged as possibly tempting for terrorists, it is clear that chemical or biological attacks are not necessarily the weapons of choice. Chemical and biological weapons attack human beings or animals primarily through the dissemination of the agent into the atmosphere and its carriage downwind to the target population. In the case of chemicals, sufficient quantities have to be delivered to cause harm to the victims, and for an effective attack significant amounts – several tons – need to be available

and spread at the right time and in the right way. In the case of biological agents, the amount required is just enough to infect an individual who inhales the agent, and the quantities involved are correspondingly less – typically kilograms. However, there are significant technical problems with biological attacks: the agent has first to be obtained, and then adequate quantities have to be grown. The agent must then be disseminated, and for effective infection the particles need to be neither so large that they fall harmlessly to the ground nor so small that they are inhaled and exhaled without being retained in the lungs. Furthermore, as biological agents are living micro-organisms, they are fragile and may be killed through the forces needed to disseminate them or the ensuing exposure to sunlight and the open air. Finally, local micrometeorology – local wind eddies, updrafts, temperatures and the like – determines whether a turbulent atmosphere results in so much dispersion and dilution that the target population does not receive enough of the agent to be infected.

In comparison with terrorist devices using explosives, chemical and biological weapons offer few attractions and much uncertainty. With explosive devices, the effects are immediate and can be accurately predicted. In chemical and biological attacks, there is much uncertainty: has enough agent been disseminated, is the particle size optimum for retention in the lung, are the meteorological conditions right to spread the agent to the target? A further disadvantage is the delay before effects are experienced – possibly hours for chemical agents, and days or weeks for biological attacks.

Assessing the threat of possible terrorist activities using biological agents has always been a question of striking the right balance – being prepared but not exaggerating the dangers. A policy of over-reaction, in which every suspicious event is assumed to be an act of bioterrorism, is not in the best interests of security. Indeed, it can suggest to the terrorists that they should resort to bioterrorism to attract

public attention, because that is what appears to gain most publicity. There is a real danger that a bioterrorism hoax could result in such an over-reaction that terrorists might be tempted into trying to mount an actual attack. A far more prudent approach is one in which there is an awareness of the possible dangers should there be a deliberate release of biological agents, and in which the existing measures to contain natural outbreaks of disease are strengthened so as to be able to cope with both natural and deliberate outbreaks.

One of the most comprehensive and considered recent assessments of chemical and biological weapons was issued by the WHO in 2004 – *Public Health Response to Biological and Chemical Weapons: WHO Guidance* (19). This recognises the uncertainties associated with the delivery of chemical or biological agents, and then makes the point that these difficulties are not the only, or even the most demanding, technical problems. In the case of biological agents, the guidance points out that there are difficulties in selecting the appropriate strain in the first place, testing it, and then maintaining its virulence throughout culturing, harvesting, processing, storage, weapon-filling, release and aerosol travel. The study concludes that although the probability of a large-scale, high-technology biological/chemical attack may be low, if such an attack nevertheless happened – if, improbably, all the many imponderables and uncertainties favoured the attacker – the consequences could be very severe. In considering strategies for national preparedness against such attacks, it would certainly be irresponsible to disregard the possible effects of deliberately released biological or chemical agents, but a prudent government would not overestimate them. Given the emotional shock of even an alleged threat of a biological or chemical release, countries need at least to consider how to address such dangers should they occur, as an integral part of the national response to other threats to public health and well-being.

The WHO study goes on to note that, whether in relation to natural disasters such as earthquakes or to large-scale accidents in industrial production, storage or transportation facilities, many countries will already have formulated a general response strategy and plan, which they will maintain and modify in the light of changing circumstances and experience. The principles of risk management for dealing with chemical or biological attacks will overlap with those for dealing with natural or man-made disasters or emergencies. The WHO goes on to say that where deliberate biological or chemical releases pose additional risk-management problems, biological or chemical amendments to an existing disaster/emergency strategy and plan will, in most circumstances, be adequate for civil preparedness.

The executive summary to the WHO study sets out a number of recommendations, of which the following are particularly pertinent in the context of this paper:

‘(1) Public health authorities, in close cooperation with other government bodies, should draw up consistency plans for dealing with a deliberate release of biological and chemical agents intended to harm civilian populations. These plans should be consistent or integral with existing plans for outbreaks of disease, natural disasters, large-scale industrial or transportation accidents, and terrorist incidents.

(2) Preparedness for deliberate releases of biological and chemical agents should be based on standard risk-analysis principles, starting with risk and threat assessment in order to determine the relative priority that should be accorded to such releases in comparison with other dangers to public health in the country concerned. Considerations for deliberate releases should be incorporated into existing public health infrastructures, rather than developing separate infrastructures.

(3) Preparedness for deliberate releases of biological or chemical agents can be markedly increased in most countries by strengthening the public health infrastructures, and particularly public health surveillance and response, and measures should be taken to this end’.

The World Health Assembly (WHA) in May 2002 adopted Resolution WHA 55.16, which should also be noted here (17). The Assembly stated that it was:

‘Underlining that the focus of the WHO is on the possible public health consequences of an incident involving biological and chemical agents and radionuclear material, regardless of whether it is characterised as a natural occurrence, accidental release or a deliberate act; [and]

Seriously concerned about threats against civilian populations, including those caused by natural occurrence or accidental release of biological or chemical agents or radionuclear material as well as their deliberate use to cause illness and death in target populations’.

It requested the Director General:

‘(1) to continue, in consultation with relevant intergovernmental agencies and other international organisations, to strengthen global surveillance of infectious diseases, water quality, and food safety, and related activities such as revision of the International Health Regulations and development of WHO’s food-safety strategy, by coordinating information gathering on potential health risks and disease outbreaks, data verification, analysis and dissemination, by providing support to laboratory networks, and by making a strong contribution to any international humanitarian response, as required;

(2) to provide tools and support to Member States, particularly developing countries, for strengthening their national health systems, notably with regard to emergency

preparedness and response plans, including disease surveillance and toxicology, risk communication, and psychosocial consequences of emergencies’.

Thus the WHA has clearly mandated the WHO to carry out various activities related to countering the deliberate release of biological, chemical or radionuclear material.

What is the risk to animals and plants

Although there are differences in precisely how deliberate releases to attack animals or plants might be carried out, the overall risk perception and the relevant countermeasures that should be taken are very similar to those described in the WHO study of risks to human populations. In short, it would be prudent to consider the possibility of deliberate releases to attack plants and animals, but this should be done in the context of the threats to animals and plants from natural outbreaks of disease. Strategies to counter such natural outbreaks should be reviewed and updated so as to cater also for deliberate releases to attack animals and plants. The WHO recommendations – if amended to replace ‘public health’ by ‘animal health’ and/or ‘plant health’ – are equally valid in considering deliberate releases to attack animals.

The WHO guidance (19), in its sections (6.5 and 6.6) relating to the FAO and to the OIE, makes the following observations. In regard to the former, the guidance notes that the FAO has not formally been involved in the control of biological or chemical weapons, but is nevertheless prepared to play an active part within its broad mandate in providing technical and humanitarian assistance. The guidance points out that in recent years the FAO has contributed significantly to emergency relief and rehabilitation when droughts, floods, earthquakes, hurricanes, locust swarms, livestock plagues, war, civil strife and natural and man-made disasters have caused immense suffering to the populations affected.

Furthermore, with regard to the OIE, the WHO notes that although the OIE has no programmes or activities specifically designed to prevent or react to biological warfare, the ongoing sharing of information on the occurrence, prevention and control of animal diseases, including zoonoses, is relevant to this objective.

The extent to which intergovernmental organisations such as the WHO, FAO and OIE are addressing the possibilities of deliberate releases to attack animals and plants must therefore be examined. Such a study will provide insight into the current situation in regard to risk communication and public perception.

Terminology

Anyone considering the risks to animals and plants needs to recognise that there is a great deal of variation in the terminology used in the different fora that consider the threats posed to humans, animals and plants by biological weapons and by terrorist attacks. For example, the term ‘agroterrorism’ is rarely used in any of the international fora. In the meetings of the States Parties to the BTWC, there is mention of ‘biological weapons’ and ‘biological terrorism’; the term ‘biosafety’ is generally used to refer to the safety of the facilities in which biological and toxin agents are held, while ‘biosecurity’ relates to the physical security of such biological agents and toxins. Other terms are rarely used. The WHO uses terms such as ‘deliberate release’ and ‘deliberate outbreaks’ of disease and, in relation to food, the term ‘food safety’, which relates to ensuring that food is free from contamination and safe to eat. The FAO uses the term ‘food security’ in relation to access to sufficient, safe and nutritious food, and uses the term ‘food safety’ in the same sense as the WHO. ‘Intentional contamination’ is used in the context of terrorist attacks against food. These different terms need to be borne in mind when activities in different fora are considered.

World Health Organization food safety

The WHA’s Resolution 55.16 adopted in May 2002, as noted above, specifically included a requirement for the Director General to continue to strengthen food safety and to develop the WHO’s food-safety strategy. It is evident that the WHO is working closely with the FAO to address food safety issues along the entire food production chain – from production to consumption – using new methods of risk analysis which provide efficient, science-based tools to improve food safety, thereby benefiting both public security and economic development. As part of this effort on food safety, the WHO in 2002 issued ‘Terrorist threats to food’ (18), with guidance for establishing and strengthening prevention and response systems. This guidance stems from the requirements of WHA Resolution 55.16 and points out that:

‘Outbreaks of both unintentional and deliberate food-borne diseases can be managed by the same mechanisms. Sensible precautions, coupled with strong surveillance and response capacity, constitute the most efficient and effective way of countering all such emergencies, including food terrorism. This document provides guidance to Member States for integrating consideration of deliberate acts of food sabotage into existing programmes for controlling the production of safe food’.

It goes on to state that:

‘Prevention, although never completely effective, is the first line of defence. The key to preventing food terrorism is establishment and enhancement of existing food safety management programmes and implementation of reasonable security measures. Prevention is best achieved through a cooperative effort between government and industry, given that the primary means for minimising food risks lie with the food industry. This document provides guidance for working with industry, and specific measures for consideration by the industry are provided.

Member States require alert, preparedness and response systems that are capable of minimising any risks to public health from real or threatened food terrorism. This document provides policy advice on strengthening existing emergency alert and response systems by improving links with all the relevant agencies and with the food industry. This multi-stakeholder approach will strengthen disease outbreak surveillance, investigation capacity, preparedness planning, effective communication and response’.

This WHO guidance provides a balanced consideration of the risk of food being used as a vehicle for terrorist acts, and compares the risks of attacks on food to those of attacks on water or air as vehicles for terrorist activities. It points out that:

‘Deliberate contamination of food might, in some regards, be easier to control than attack through air or water. The safety of food is closely controlled in many developed countries, both by the government and the private sector. Food safety infrastructures offer a means for preventing and mitigating sabotage of the food supply. The dietary diversity available in many developed countries also reduces the likelihood that the entire food supply would be contaminated and would tend to dilute potential health effects. In addition, international food safety initiatives and enhanced disease surveillance and response activities can be developed for preventing and responding quickly to food terrorism. On the other hand, food is also the most vulnerable to intentional contamination by debilitating or lethal agents. The diversity of sources of foods, including the global market, makes prevention difficult, if not impossible. At the same time, many developing countries lack basic food safety infrastructures and are vulnerable to deliberate acts of sabotage’.

In regard to the role of other international organisations relevant to food safety, the WHO guidance notes that while the WHO has the mandate to address aspects of human health as they pertain to food, the FAO addresses agricultural production and food security, including food quality and safety issues. The WHO has many links with the food safety aspects of FAO programmes which are implemented in the context of food security – to ensure the

access of all to sufficient, safe and nutritious food. In meeting this mandate, the FAO provides advice to member governments (and to food producers, the food industry and consumers) on the application of food safety management systems and effective national controls to prevent food contamination. More broadly, the FAO provides support to agriculture and fishing communities to increase production and improve the living conditions of rural populations. This combination of assuring a safe and nutritious food supply for all while supporting the agriculture and fisheries sectors makes a suitable starting point for responsible action along the food chain. In addition to food safety, the FAO Plant Protection Service addresses plant health and quarantine matters, while animal health matters are the concern of the FAO Animal Production and Health Division.

In contrast to the links between the WHO and FAO, the links between the WHO and OIE do not appear to be as close. The WHO guidance notes that the OIE is concerned primarily with animal health and quarantine issues. Due to the increasing demand of consumers for improved food safety worldwide, the OIE has identified the need to expand its normative and scientific activities into ‘animal production food safety’ and to work with other relevant organisations in addressing and preventing the ‘production to consumption’ food-borne hazards of animal products (meat, milk, eggs, honey etc.).

Food and Agriculture Organization food safety

At the 32nd FAO Conference in December 2003, there was a Ministerial Round Table (5) which addressed the dimension of food safety in food security. The Round Table pointed out that the 1996 World Food Summit Plan of Action defines food security in the following way: ‘Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life’. The Plan then states that food safety refers to those hazards associated with food that can cause ill-health in humans. A number of the hazards occur naturally; others are the results of contamination. Some, such as microbial pathogens, may cause acute illnesses; others may increase the risk of chronic diseases such as cancer. There is a universal agreement that food should be safe.

The report of the December 2003 conference includes no specific mention of terrorism or of intentional contamination. Indeed, searches of the FAO website using the word ‘terror’ register no hits, although searching under ‘contamination’ does reveal a document (4) entitled

'Terrorist threats to foods' submitted by the WHO to the FAO/WHO Global Forum of Food Safety Regulators held in Marrakech, Morocco on 28 to 30 January 2002. This paper gives a reasoned overview of the potential for deliberate contamination of foodstuffs, and notes that the WHO and FAO are widening their disease surveillance and response operations to include food sabotage and to provide guidance to Member States in developing programmes for the prevention and detection of terrorist threats to food, and for responding to any attacks.

The 2nd FAO/WHO Global Forum of Food Safety Regulators, held in Bangkok, Thailand, on 12 to 14 October 2004, addressed the prevention of and response to intentional contamination on the basis of a paper (7) prepared by the FAO/WHO secretariat. During this forum, the WHO announced (6) the inauguration of the International Food Safety Authorities Network (INFOSAN), which had been developed in cooperation with the FAO to promote the exchange of food safety information and to improve collaboration among food safety authorities at national and international levels. It is clear that INFOSAN recognises that the rapid globalisation of food production and trade has increased the likelihood of international incidents involving contaminated food, and that INFOSAN has a role to play as one of the basic preparedness measures that need to be taken in regard to terrorist threats to food.

World Organisation for Animal Health food safety

At the 32nd Conference of the FAO, note was taken of the long-standing cooperation between the FAO and the OIE, which dates back to 1947, when an informal arrangement was concluded between the two organisations. Subsequent to that, in 1953, an interim Agreement had been concluded and confirmed by the Conference. The Conference further noted that over the years cooperation had expanded and now covered a wide range of areas in animal health involving, in particular, exchange of information, consultation and exchange of experience on studies and projects. As a result, there was a need to better coordinate the efforts of the two organisations in control of animal diseases and food safety within the framework of their respective mandates, through a new Agreement which was affirmed by the Conference. This sets out the responsibilities of the OIE and the FAO, and lists a number of areas in which joint action will be taken.

At the 2003 OIE International Committee meeting, the Codex Alimentarius Commission, which is responsible for the development of scientific standards for the protection of consumer health and good commercial practices, noted

that the Codex has to meet new challenges, and that collaboration with the OIE is a priority for its future strategy. As a result of global developments, the Codex has to take into account the growth in international trade, food-borne diseases, new technologies, new food production systems and food bioterrorism.

A year later, at the 2004 OIE International Committee meeting, bioterrorism was mentioned as one of the reasons why animal identification and traceability were of increasing importance. The Working Group on Wildlife Diseases had studied in detail the risk of wildlife disease crossing borders – and underlined the specific risk of such diseases being introduced as a result of a terrorist act – and measures to be taken to reduce the ecological and health consequences should this occur. The Group had consequently agreed to prepare a generic draft emergency preparedness plan.

The 2005 OIE International Committee meeting noted that New Zealand had been faced with an act of bioterrorism and that such acts could happen anywhere in the world. The meeting observed that the OIE continues to work within the framework of the Biological and Toxin Weapons Convention; noting that representatives of the approximately 150 States Parties to the Convention currently meet annually in Geneva, Switzerland. The OIE, with the support of the FAO and the WHO, has indicated to the States Parties to the Convention that the most effective way of preventing bioterrorism using animal pathogens was to strengthen national Veterinary Services by improving their early-warning and surveillance systems for animal diseases, and for all Member Countries to comply strictly with OIE standards.

Analysis

Thus, all three of the relevant intergovernmental organisations – the WHO, FAO and OIE – are evidently engaged in considering how to strengthen food safety measures and preparedness for outbreaks of disease in animals and plants; such preparations include to a greater or lesser extent consideration of both natural and intentional outbreaks. There is, however, considerable variation in the extent to which these measures explicitly address bioterrorism, and the term 'agroterrorism' is rarely used. This variation in terminology also occurs in national websites: thus the Department of Agriculture in the USA highlights agroterrorism (www.usda.gov/homelandsecurity), whereas in the UK there is no mention of this on the Department of the Environment, Food and Rural Affairs website (although there is mention of food safety and biosecurity, which is defined as taking steps to make sure that good hygiene practices are in place to help prevent the spread of animal disease; see

www.defra.gov.uk/animalh/diseases/control/biosecurity/index.htm). The European Union also addresses food safety and biological safety, but although it has a website page (http://europa.eu.int/comm/food/international/trade/bioterror_en.htm) on bioterrorism, this is entirely concerned with the implementation of the US Bioterrorism Act 2002. The article notes that, 'While fully supporting the aim of protecting the food supply chain, the European Community is concerned about the effectiveness, and potential for trade distortion, of the measures proposed'. In Canada, the Canadian Food Inspection Agency has in place well-planned emergency response procedures (www.inspection.gc.ca/english/liaison/secur/secure.shtml) aimed at protecting food, plants and animals from accidental or intentional events, and is ready to act rapidly and effectively in response to emergencies affecting food safety and the agricultural sector.

There would be benefits from the adoption of a more consistent approach in which the three intergovernmental organisations and various national authorities adopted similar terminology. This would make it easier to reassure those concerned that measures have indeed been taken to counter the dangers posed by both natural and intentional outbreaks of disease or contamination of food supplies.

Three key questions, which this paper will address in turn, are:

- what is the risk?
- what is the public perception of the risk?
- what risk communication is needed – and to whom?

What is the risk?

There is undoubtedly a risk that there may be deliberate attempts to cause outbreaks of disease in animals or plants, or intentional contamination of food. There is much to be said for addressing this risk as part of international and national preparedness for dealing with outbreaks of disease and with contamination of the food supply chain, as the measures that need to be taken are the same whether an outbreak is natural or deliberate and whether contamination is accidental or intentional. All countries have a common interest in ensuring that their animals and plants are healthy and free from disease, and that the food supply chain provides safe food.

There is no advantage in putting too much emphasis on the possibility of deliberate outbreaks of disease or of intentional contamination, nor from highlighting vulnerabilities. It is far more prudent to work on enhancing measures to ensure the health of animals and plants and the safety of the food chain, while making it

clear that these measures will address both natural and deliberate outbreaks and accidental and intentional contamination. Such an approach will deter would-be terrorists and criminals and provide reassurance to the public that the national and international authorities and agencies are prepared.

What is the public perception of the risk?

Public perceptions are influenced by reports in the press and television, which tend to seek controversy and to increase public concern and alarm – 'Good news is not news!' is all too true in the age we live in. Reports of terrorist incidents and the emphasis on 'breaking news' tend to focus on the alarm and disruption caused, rather than on the preparedness and professionalism of the emergency services and national ministries. There is a need to ensure that the press and television are provided with accurate, proactive information, and for a sense of responsibility to be engendered among press and television reporters of the importance of balance and of providing reassurance to the public.

The public is generally unaware that biological weapons, whether against humans, animals or plants, are totally prohibited. There is a need for countries to do much more to educate the public through programmes in schools and in universities that make everyone aware that biological agents and toxins are totally prohibited under the BTWC and national implementing legislation. Such national legislation should make it illegal for any individual to carry out an attack using biological agents or toxins, and thus make it illegal for terrorists or criminals to perform such acts.

Public concerns in regard to animals and plants are closely related to confidence that the food people eat is safe and will not cause them short or long-term harm. The public around the world is increasingly looking to national governments to provide such assurance and to demonstrate that food is indeed safe.

What risk communication is needed – and to whom?

As a deliberate attack or intentional contamination in one country can have serious consequences in another, there is a need for the WHO, FAO and OIE to recognise this in their advice to their Member States in regard to disease surveillance and product safety measures. They should

ensure that all Member States have effective, well-rehearsed preparedness plans in place to deal with outbreaks of disease, whether natural or deliberate, and with contamination, whether accidental or intentional, of the food supply chain.

While the World Health Assembly has clearly recognised the dangers and taken appropriate action, it is not evident that the FAO Conference or the OIE International Committee have provided as clear a mandate to the FAO and the OIE to be prepared to deal with outbreaks of disease or with contamination of the food supply chain, whether accidental or intentional. The Member States of the FAO and the OIE should take steps to ensure that the FAO and OIE have comparable mandates to that given to the WHO by the WHA. All three intergovernmental organisations need to work together to harmonise their preparations and thereby encourage all Member States to take appropriate national measures.

At the public level, the Member States need to reassure their citizens that their governments – and the governments of neighbouring countries – have effective, well-rehearsed plans in place to deal with outbreaks of disease and with contamination of the food supply chain, whether accidental or intentional, as described earlier. Governments need to recognise their responsibility for ensuring that the national and international press and television are provided with accurate and timely information. While much can be done to educate the press and television about the total prohibition on deliberate outbreaks, and the measures in place to counter them prior to any such incident, it is essential during any attack that the press and television – and through them the public – are kept informed in real time of what is being done. Governments have to recognise that if they do not provide accurate and timely information, the media will seek ‘talking heads’ to speculate and, if these people are ill-informed or untrained to deal with the media, the frenzy for ‘stories’ will aggravate the situation. There are also direct international benefits if the government is providing accurate and timely information, as neighbouring countries will be reassured that all possible steps are being taken to control and contain any outbreak. The more transparent the activities of the government of the country in which an attack has occurred, the greater and faster will be the international support and assistance. Furthermore, the imposition of trade restrictions by neighbouring countries will be less likely if the government can clearly demonstrate that it has taken all necessary steps to prevent the further spread of disease or contamination. In addition, governments should remind the public that any actions intended to cause an outbreak or contamination are totally prohibited, and any instigators will be prosecuted with the full force of the national laws. Effective public communication of preparedness and of the illegality of any such action will also help to deter terrorists or criminals

from undertaking such attacks. Clear statements of these facts would form part of the web of assurance and deterrence that has long been advocated (11) as the counter to the threat of biological weapons.

There continues to be a vital need in every country for all the elements of the ‘web of assurance’, to assure the public that all reasonable steps have been taken both nationally and internationally. The web of assurance is made up of the following elements:

a) international and national regimes that totally prohibit chemical and biological weapons:

- the universality of the BTWC and CWC and the 1925 Geneva Protocol
- the withdrawal of all reservations to the Geneva Protocol
- a legally binding instrument to strengthen the effectiveness of the BTWC
- national implementing legislation for the BTWC and CWC in all countries

b) controls on dangerous pathogens and chemicals:

- addressing handling, use, storage and transfer both nationally and internationally

c) wide-ranging protective measures:

- preparedness, detection, diagnosis and medical countermeasures
- preparedness before and after release

d) determined national and international response to use or threat of use of chemical or biological weapons:

- diplomatic actions, sanctions, military intervention
- a recognition of their responsibilities by the five permanent members of the United Nations Security Council
- national prosecution of instigators.

A strong, publicly declared commitment to such a web of assurance both nationally and internationally provides two immense benefits: first it could deter the would-be user, and second it would reassure the public both nationally and internationally that all reasonable steps are being taken to ensure their safety and security.

Communication sur le risque de bioterrorisme contre les animaux et les végétaux et perception de ce risque par le public

G.S. Pearson

Résumé

Cet article se penche sur l'interdiction internationale totale d'utiliser la maladie pour porter atteinte à l'homme, aux animaux et aux végétaux, en faisant remarquer que plusieurs pays ont par le passé élaboré des programmes axés sur des attaques contre ceux-ci. Les activités menées par des organisations intergouvernementales – l'Organisation mondiale de la santé (OMS), l'Organisation des Nations unies pour l'alimentation et l'agriculture (FAO) et l'Organisation mondiale de la santé animale (OIE) – pour faire face à la menace d'attaques contre l'homme, les animaux et les végétaux sont examinées. Des parades efficaces contre des attaques délibérées doivent être élaborées en harmonie avec les mesures existantes visant à maîtriser les foyers naturels ou accidentels de maladie. Enfin, l'article évalue le risque et la perception qu'en a le public, et examine le type de communication des risques requis et ses destinataires. La FAO et l'OIE doivent être investies de mandats clairs pour qu'elles soient préparées à faire face à des foyers de maladie et à une contamination, tant accidentelle qu'à des fins malveillantes, de la chaîne d'approvisionnement alimentaire.

Mots-clés

Animal – Bioterrorisme – Chaîne d'approvisionnement alimentaire – Communication sur les risques – Contamination – Foyer de maladie – Foyer d'origine intentionnelle – Perception du public – Risque – Végétal.



La opinión pública y la comunicación del riesgo en relación con actos de bioterrorismo contra animales y plantas

G.S. Pearson

Resumen

El autor examina la prohibición internacional absoluta de utilizar enfermedades para atacar a seres humanos, animales o plantas, y señala a este respecto que varios países pusieron en marcha en el pasado programas destinados a tales fines. También pasa revista a las actividades que llevan a cabo actualmente organizaciones intergubernamentales como la Organización Mundial de la Salud (OMS), la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO) o la Organización Mundial de Sanidad Animal (OIE) para desactivar la amenaza de ataques contra seres humanos, animales o plantas. Para contrarrestar ataques intencionados hay que preparar medidas que estén en consonancia con las que se aplican actualmente a la lucha contra brotes infecciosos naturales o accidentales. Por último, el autor evalúa el riesgo y la forma en que éste es percibido por el gran público, y se plantea qué tipo de comunicación al respecto se necesita y a quién debe ir dirigida. Es preciso

asignar un claro mandato a la FAO y la OIE para que, llegado el momento, sean capaces de hacer frente a brotes de enfermedad o a la contaminación, ya sea accidental o intencionada, de la cadena de abastecimiento alimentario.

Palabras clave

Animal – Bioterrorismo – Brote de enfermedad – Brote de origen intencionado – Cadena de abastecimiento alimentario – Contaminación – Opinión pública – Planta – Proceso de comunicación del riesgo – Riesgo.



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