

**AD HOC GROUP OF THE STATES PARTIES  
TO THE CONVENTION ON THE PROHIBITION  
OF THE DEVELOPMENT, PRODUCTION AND  
STOCKPILING OF BACTERIOLOGICAL  
(BIOLOGICAL) AND TOXIN WEAPONS  
AND ON THEIR DESTRUCTION**

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**PROPOSED TEXT FOR ARTICLE III – DECLARATIONS**

**I. LISTS AND CRITERIA (AGENTS AND TOXINS)**

1. The following lists of human and animal pathogens and toxins are intended for use with Article III, section D, subsection I, part G<sup>1</sup> and for any other declaration in section D involving a list of agents and/or toxins.
2. As the human and animal pathogens and toxin lists will be hard to define we propose several tables of enlisted pathogens and toxins with important criteria on the basis of which a decision can be made to include in or exclude from a list of bacteriological (biological) agents and toxins. These tables are preliminary and can serve as the basis for discussion and as help on defining the final list of bacteriological (biological) agents and toxins.

**CRITERIA FOR HUMAN PATHOGENS AND TOXINS**

[The following criteria were discussed by the Group and may be used in combination for selection of human pathogens and toxins to be included in a list of bacteriological (biological) agents and toxins:] (see tables 1, 2 and 3)

1. [Vectors or] Agents known to have been developed, produced, stockpiled or used as weapons;
2. Likely methods and high level of dissemination or cover a large area as aerosol, spores in aerosol, sabotage (food and water supply), infected vector;
3. Low infection dose or high toxicity [or potency];
4. High level of morbidity [and short incubation or latent period];
5. High level of contagiousness in population (transmissibility man to man especially through contact);

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1. Work with listed agents and/or toxins.

6. Infection or intoxication [by variety of route, especially] by respiratory route;
7. High level of incapacity or mortality;
8. Stability in the environment;
9. No effective prophylaxis (i.e. immune sera, vaccines or antibiotics) and/or therapy commonly available and widely in use;
10. Difficulty of detection or identification [at the early stage];
11. Ease of production [and transportation].

#### ADDITIONAL CRITERIA FOR TOXINS

The following additional criteria can be discussed by the Group and may be used in combination for selection of toxins to be included in/excluded from a list of toxins (see table 4):

**Toxicity or potency:**

- 1 = Effective dose for 50% or ED<sub>50</sub> (and LD<sub>50</sub>) in the 10<sup>-9</sup> g/kg range.
- 10 = Effective dose for 50% or ED<sub>50</sub> (and LD<sub>50</sub>) in the 10<sup>-3</sup> g/kg range.

**Onset:**

In this table, immediate (battlefield relevant) onset rather than delayed (terrorist relevant) onset is considered desirable.

- 1 = Minutes to hours onset.
- 10 = Multiple hours or days to onset.

**Level of incapacity/mortality:**

The number assigned in the table depends on whether the goal is to hinder the enemy or to kill.

- 1 = Severely incapacitating.
- 10 = Invariably lethal.

**Likely methods of dissemination:**

- 1 = Toxin could be aerosolized and delivered to cover large areas for aerosol contamination. Toxin could be used in sabotage for contamination food and water.
- 10 = Toxin could not be aerosolized and delivered to cover large areas for aerosol contamination. Toxin could be difficult used in sabotage.

**Stability in environment/storage:**

This factor refers to stability in storage or weapons and environment.

- 1 = Extremely stable in storage and environment.

10 = Unstable in environment or requires special storage conditions.

**Ease of decontamination:**

1 = Extremely difficult to decontaminate after a toxin aerosol attack.

10 = Decontamination would be relatively unimportant and general decontamination procedures effectively destroy toxin.

**Production** (Ease of production and transportation):

1 = Low technology, low cost, widely available (e.g. fermentation).

10 = Cutting edge, high cost, only available to specialized teams (e.g., solid phase synthesis of >100 amino acid polypeptides, advanced genetic manipulation).

### CRITERIA FOR ANIMAL PATHOGENS

The following criteria were discussed by the Group and may be used in combination for selection of animal pathogens to be included in a list of bacteriological (biological) agents and toxins (see table 5):

1. [Vectors or] Agents known to have been developed, produced or used as weapons;
2. Agents which have severe socio-economic and/or significant adverse human health impacts to be evaluated against a combination of the following criteria:
  - (a) High morbidity and/or mortality rates;
  - (b) Short incubation period and/or difficult to diagnose/identify at an early stage;
  - (c) High transmissibility and/or contagiousness;
  - (d) Lack of availability of cost-effective protection/treatment;
  - (e) Low infective/toxic dose;
  - (f) Stability in the environment;
  - (g) Ease of production.

### CRITERIA FOR PLANT PATHOGENS

The following criteria were discussed by the Group and may be used in combination for selection of animal pathogens to be included in a list of bacteriological (biological) agents and toxins (see table 6):

1. [Pests or] Agents known to have been developed, produced or used as weapons;
2. Agents which have severe socio-economic and/or significant adverse human health impacts, due to their effect on staple crops, to be evaluated against a combination of the following criteria:
  - (a) Ease of dissemination (wind, insects, water, etc.);
  - (b) Short incubation period and/or difficult to diagnose/identify at an early stage;
  - (c) Ease of production;
  - (d) Stability in the environment;
  - (e) Lack of availability of cost-effective protection/treatment;
  - (f) Low infective dose;
  - (g) High infectivity;
  - (h) Short life cycle.

For all pathogens and toxins there are not enough correct data for first criteria in open literature:

[Vectors or] Agents known to have been developed, produced or used as weapons.

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**Table 1. Human pathogens (viruses) assessment according to criteria for selecting pathogens as BW**

Viruses	Weapo-nized	High level of disse-mi-nation	Low in-fec-tion dose	High level of morbi-dity	High con-tagiousness (transmissibility man to man)	Infection by variety of route (respiratory route)	High level of incapacity/mortality	Stability in the environ-ment	Difficulty of detec-tion/iden-tification	No effec-tive pro-phy-laxis and/or therapy	Ease of produc-tion	Totals +/-
Crimean-Congo HF virus	+	+	+	+	+	+	+	+	+	-	+	10/1
EEE virus	+	+	+	+	-	+	+	-	+	+	+	9/2
Ebola virus	+	+	+	+	+	-	+	-	+	+	+	9/2
[Sin Nombre virus]	-	+	+	-	-	+	+	-	+	+	-	6/5
[Hantaan virus]	+	+	+	+	-	+	-	+	+	+	+	9/2
Junin virus	-	+	+	+	-	+	+	-	+	+	-	7/4
Lassa fever virus	+	+	+	+	-	+	+	+	+	+	+	10/1
Machupo virus	-	+	+	+	+	+	+	-	+	+	+	9/2
Marburg virus	+	+	+	+	+	-	+	-	+	+	+	9/2
Rift Valley fever virus	+	+	+	+	-	+	-	+	+	-	+	8/3
Tick-borne enceph. virus	+	+	+	+	-	+	+	-	+	-	+	8/3
Variola major virus	+	+	+	+	+	+	+	+	+	-	+	10/1
VEE virus	+	+	+	+	-	+	+	-	+	-	+	8/3
WEE virus	+	+	+	+	-	+	+	-	+	-	+	8/3
Yellow fever virus	+	+	+	+	-	+	+	-	+	-	+	8/3
Monkeypox virus	-	+	+	+	+	+	+	+	+	-	+	9/2
Chikun-Gunya fever v. (CHIK)	-	+	+	-	-	+	-	-	+	+	+	6/5
Dengua fever virus	+	+	+	+	-	+	-	-	+	+	+	8/3
Omsk HF virus	-	+	+	+	-	+	-	-	+	+	+	7/4

**Table 2. Human pathogens (bacteria, rickettsiae, protozoa and fungi) assessment according to criteria for selecting pathogens as BW**

Bacteria Rickettsiae Protozoa Fungi	Weapo- nized	High level of dissemi- nation	Low infection dose	High level of morbi- dity	High contagiousness (transmissibility man to man)	Infection by a variety of route (respi- ratory route)	High level of incapa- city or mortality	Stability in the environ- ment	Difficulty of detec- tion/iden- tification	No effective prophylaxis (vaccina- tion)	No effective therapy (antimi- crobial)	Ease of produc- tion	Totals +/-
<b>BACTERIA</b>													
Bacillus anthracis	+	+	+	+	-	+	+	+	+	-	+	+	10/2
Brucella abortus	+	+	+	+	-	+	-	+	+	-	+	+	9/3
Brucella melitensis	+	+	+	+	-	+	-	+	+	-	+	+	9/3
Brucella suis	+	+	+	+	-	+	-	+	+	-	+	+	9/3
Burkholderia (Pseudomonas) mallei	+	+	+	+	-	+	+	+	+	+	-	+	10/2
Burkholderia (Pseudomonas) pseudomallei	+	+	+	+	-	+	+	+	+	+	-	+	10/2
Chlamydia psittaci	+	+	+	+	-	+	-	+	+	+	-	+	9/3
Francisella tularensis	+	+	+	+	-	+	+	+	+	-	-	+	9/3
Yersinia pestis	+	+	+	+	+	+	+	-	+	-	+	+	10/2
<b>RICKETTSIAE</b>													
Coxiella burnetti	+	+	+	+	-	+	-	+	+	-	-	+	8/4
Rickettsia prowazekii	+	+	+	+	-	+	+	-	+	+	-	+	9/3
Rickettsia rickettsii	+	+	+	+	-	+	-	-	+	+	-	+	8/4
<b>PROTOZOA</b>													
Naegleria fowleri	-	+	-	+	+	+	+	+	+	+	-	+	9/3
Naegleria australiensis	-	+	-	+	+	+	+	+	+	+	-	+	9/3
<b>FUNGI</b>													
Coccidioides immitis	-	+	-	-	-	+	+	+	+	+	-	+	7/5
Histoplasma capsulatum	-	+	-	-	-	+	+	+	+	+	-	+	7/5
Nocardia asteroides	-	+	-	-	-	+	+	+	+	+	-	+	7/5



**Table 3. Toxin assessment according to criteria for selecting toxins as TW**

Toxin/ Bioregulator	Weapo- nized	High toxicity	High morbidity	Intoxication by variety of route - respiratory route	High level of incapacity/ mortality	No effective prophylaxis/ therapy	Stability in the envi- ronment	Difficulty of detection/ identification	Ease of produc- tion	Totals +/-
Abrin	-	+	+	+	+	+	+	+	+	8/1
Aflatoxins	+	+	+	+	+	+	+	+	+	9/0
Anatoxin A	+	+	+	+	+	+	-	+	+	8/1
Batrachotoxin	-	+	+	+	+	+	-	+	+	7/2
Botulinum toxins	+	+	+	+	+	+	+	+	+	9/0
Brevetoxins	-	+	+	+	+	+	+	+	-	7/2
Bungarotoxins	+	+	+	+	+	+	-	+	-	7/2
Centruroides toxins	-	+	+	+	+	+	+	+	+	8/1
Ciguatoxin	-	+	+	+	+	+	-	+	-	6/3
Cyanguinosins/Microcystins	-	+	+	+	+	+	-	+	-	6/3
Diphtheria toxin	-	+	+	+	+	+	-	+	-	6/3
Modeccin	+	+	+	+	+	+	+	+	+	9/0
Palytoxin	-	+	+	+	+	+	+	+	-	7/2
Ricin	+	+	+	+	+	+	+	+	+	9/0
Saxitoxin	+	+	+	+	+	+	+	+	+	9/0
Staphylococcal enterotoxins (SEB)	+	+	+	+	+	+	+	+	+	9/0
Shigatoxin	+	+	+	+	+	+	+	+	+	9/0
Tetanus toxin	+	+	+	+	+	-	+	+	+	8/1
Tetrodotoxin	+	+	+	+	+	+	+	+	-	8/1
Toxins of <i>Cl. perfringens</i>	+	+	+	+	+	+	-	+	+	8/1
Trichotecene Mycotoxins (T2,DON,HT2)	+	+	+	+	+	+	+	+	+	9/0
Verrucologen	-	+	+	+	+	+	-	+	-	6/3
Viscumin	-	+	+	+	+	+	+	+	-	7/2
Volkensin	-	+	+	+	+	+	-	+	-	6/3



**Table 4. Toxin risk assessment (the lower the total number means the more dangerous the toxin as TW)**

Toxin/ Bioregulator	Toxicity or potency	Onset	Level of incapacity/ mortality	Likely methods of dissemination	Stability in the environment/ storage	Ease of deconta- mination	Ease of production	Totals
Abrin	2	6	5	5	5	5	1	29
Aflatoxins	4	8	5	5	5	1	3	31
Anatoxin A	6	1	6	7	6	8	3	37
Batrachotoxin	5	1	6	4	9	8	8	41
Botulinum toxins	1	3	7	3	2	6	1	23
Brevetoxins	3	6	2	4	2	3	8	28
Bungarotoxins	3	4	6	5	8	7	8	41
Centruroides toxins	3	4	6	5	2	5	8	33
Ciguatoxin	3	7	6	6	8	5	9	44
Cyanginosins/Microcystins	6	2	5	3	7	7	8	38
Diphtheria toxin	2	3	6	5	5	7	3	31
Modeccin	3	6	5	4	5	5	1	29
Palytoxin	3	4	8	3	5	3	9	35
Ricin	3	6	8	3	2	5	1	28
Saxitoxin	3	2	8	3	3	7	5	31
Staphylococcal enterotoxins (SEB)	4	6	2	2	3	5	2	24
Shigatoxin	1	4	2	3	3	7	2	22
Tetanus toxin	1	9	8	4	3	7	2	34
Tetrodotxin	3	4	5	3	5	5	9	34
Toxins of <i>Cl. perfringens</i>	3	6	8	3	3	7	3	33
Trichotecene Mycotoxins (T2,DON,HT2)	7	2	7	2	1	2	2	23
Verrucologen	3	7	6	5	6	6	3	36
Viscumin	3	6	5	5	6	6	1	32
Volkensin	4	5	7	6	7	5	4	38

Toxin/ Bioregulator	Toxicity or potency	Onset	Level of incapacity/ mortality	Likely methods of dissemination	Stability in the environment/ storage	Ease of deconta- mination	Ease of production	Totals
Endothelin/Sarafotoxin	1	1	7	2	3	5	4	23

**Table 5. Animal pathogens assessment according to criteria for selecting pathogens as BW**

Animal pathogens	Weapo-nized	Severe socio-economic/human health impacts	High morbidity/mortality rates	Short incubation period	High transmissibility/contagiousness	Low infective/toxic dose	Difficult to diagnose/identify at an early stage	Stability in the environment	Cost-effective protection/treatment	Ease of production	Totals +/-
<b>VIRUSES</b>											
African swine fever virus	+	-	+	+	+	+	+	+	-	+	8/2
Avian influenza virus	+	-	+	+	+	+	+	+	-	+	8/2
Camel pox virus	-	-	+	+	-	+	+	+	-	-	5/5
Classic swine fever virus	+	+	+	+	+	+	+	+	+	+	10/0
Foot and mouth virus	+	+	+	+	+	+	+	+	+	+	10/0
Newcastle disease virus	+	+	+	+	+	+	+	+	-	+	9/1
Pest des petits ruminants virus	+	-	+	+	+	+	+	+	-	+	8/2
Rinderpest virus	+	+	+	+	+	+	+	+	+	+	10/0
Porcine enterovirus type 1	+	+	+	+	+	+	+	+	-	+	9/1
Vesicular stomatitis virus	+	+	+	+	+	+	+	+	-	+	9/1
African horse sickness virus	-	-	+	+	-	+	+	-	-	+	5/5
Lumpy skin disease virus	-	-	-	+	-	+	+	+	-	-	4/6
<b>MYCOPLASMAS</b>											
Contagious bovine (pleuropneumonia) (M. mycoides var. mycoides) (CBPP)	-	-	-	-	+	+	+	+	-	+	5/5
Contagious caprine (pleuropneumonia) (M. mycoides var. capri) (CCPP)	-	-	-	-	+	+	+	+	-	+	5/5

**Table 6. Plant pathogens assessment according to criteria for selecting pathogens as BW**

Plant pathogens	Weapo-nized	Severe socio-economic/human health impacts	Short incubation period	Ease of dissemination (wind, insects, water, etc.)	Short life cycle	Low infective dose and infectivity	Difficult to diagnose/identify at an early stage	Stability in the environment	Cost-effective protection/treatment	Ease of produc-tion	Totals +/-
<b>FUNGI</b>											
<i>Colletotrichum coffeanum</i> var. <i>virulans</i>	-	-	+	+	-	+	+	+	-	+	6/4
<i>Dothistroma pini</i> ( <i>Scirrhia pini</i> )	-	-	+	+	-	+	+	+	-	-	5/5
<i>Claviceps purpurea</i>	-	+	+	+	-	-	+	-	+	+	6/4
<i>Peronospora hyoscyami</i> de Bary	-	-	+	+	-	-	+	+	-	-	4/6
<i>Puccinia graminis</i>	+	+	+	+	-	+	+	+	-	+	8/2
<i>Puccinia striiformis</i> ( <i>P. glumarum</i> )	-	+	+	+	-	+	+	+	-	+	7/3
<i>Pyricularia oryzae</i>	+	+	+	+	-	+	+	+	-	+	8/2
<i>Ralstonia solanacearum</i>	-	-	+	+	-	-	+	+	+	-	5/5
<i>Sclerotinia sclerotiorum</i>	-	+	+	+	-	+	+	-	-	-	5/5
<i>Tilletia indica</i>	+	+	+	+	-	+	+	+	-	+	8/2
<i>Ustilago maydis</i>	+	+	+	+	-	+	+	+	-	+	8/2
<b>BACTERIA</b>											
<i>Erwinia amylovora</i>	-	+	+	+	-	+	+	-	-	+	6/4
<i>Xanthomonas albilineans</i>	-	+	+	+	-	+	+	-	+	+	7/3
<i>Xanthomonas campestris</i> pv. <i>citri</i>	-	+	+	+	-	+	+	-	+	+	7/3
<i>Xanthomonas campestris</i> pv. <i>oryzae</i>	-	+	+	+	-	+	+	-	+	+	7/3
<b>VIRUSES</b>											
Sugar cane Fiji disease virus	-	+	+	-	-	+	+	-	-	+	5/5