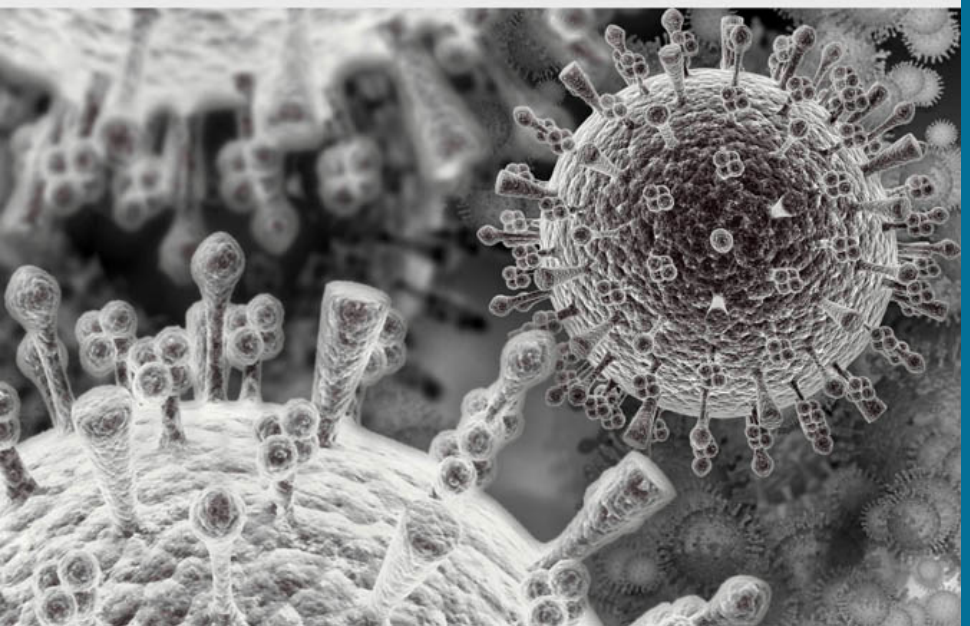
Ministry of Foreign Affairs of the Netherlands

KNAW symposium
Biological agents: non-proliferation and export controls

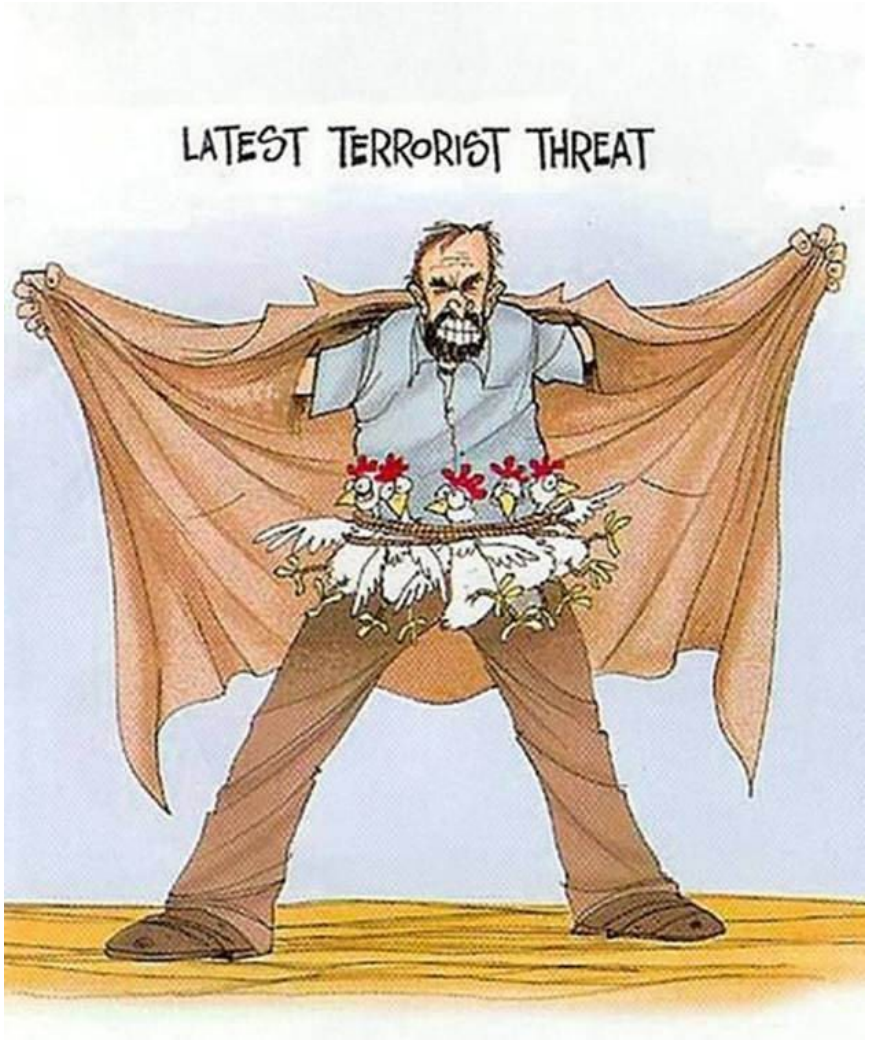


Kees Jan Steenhoek, October 5th 2016

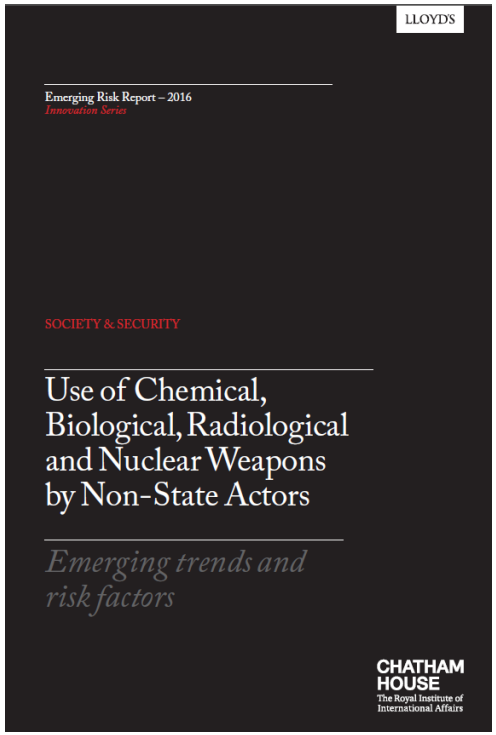
Ministry of Foreign Affairs

Non-proliferation:
drs Kees Jan Steenhoek

Export controls:
drs Gerlof Kruidhof


LATEST TERRORIST THREAT

International threat



Biological weapons

2A

Seven days after the attacks on the World Trade Center in September 2001, anonymous letters laced with deadly anthrax spores were sent to the offices of several news media companies and two Democratic US Senators. Over the following months, five people were killed and 17 others infected as a result of inhaling the pathogen. An investigation into the attack by the FBI spanned eight years, eventually identifying a lone army scientist as the likely perpetrator.[41,42]

2B[43]

Toxic biological weapons

- Potentially available in the environment but extraction can be difficult
- May not be environmentally stable – may have low persistency and be difficult to disseminate effectively
- Most effective when administered like a poison
- Toxicity varies by agent, but some are among the most lethal substances
- Only supportive care is available in most cases

Examples: ricin, SEB (staphylococcal enterotoxin B), botulinum, trichothecene

Infectious biological weapons

- Potentially available in the environment but selection, culturing and weaponisation are challenging
- Difficult to control spread and ensure infectivity
- Infectivity and morbidity vary widely
- Some vaccines and treatments are available

Examples: E. Coli, monkeypox, brucellosis

Most common example: anthrax[44]

- Low infectivity
- Can be spread by close contact (rare), or through ingestion or injection (quite common)
- Can be encouraged to form a spore which makes it very stable and suitable for dispersion and infection by inhalation
- Disease may take time to develop as the spore remains dormant; exposed population may therefore require extensive antibiotic treatment (90 days or more)
- Vaccines and post-exposure treatments are available
- Untreated inhalational exposure is highly lethal

Legal framework +international commitments

- BTWC
  - 1972
- Export control regimes:
  Australia group
  - 1985, 42 members
- UNSCR 1540 (2004)
  - “thou shalt have export controls”
  - None-state actors

Biosecurity – international commitments (1a)

BTWC – article III

“Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in article I of this Convention. “

Biosecurity – international commitments (1b)

BTWC – article X

"(1) States Parties undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. (…)

(2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development (…) or international cooperation in the field of peaceful bacteriological (biological) activities (…) for peaceful purposes (…)."

Biosecurity - International commitments (2)

Australia Group – Guidelines

"1. The purpose of these Guidelines is to limit the risks of proliferation and terrorism involving chemical and biological weapons (CBW) by controlling tangible and intangible transfers that could contribute to CBW activities by states or non-state actors, consistent with Article III of the Biological Weapons Convention, Article I of the Chemical Weapons Convention, and all relevant United Nations Security Council Resolutions. In accordance with Article X of the Biological Weapons Convention and Article XI of the Chemical Weapons Convention, these Guidelines are not intended to impede chemical or biological trade or international cooperation that could not contribute to CBW activities or terrorism. (...)"

Biosecurity – international commitments (3)

UNSCR 1540 - Paragraph 3

All states shall prevent the proliferation of nuclear, chemical or biological weapons and their means of delivery by:

a) Controlling production, use, storage and transport

b) Physical protection measures

c) (border) Controls on illicit trafficking and brokering

d) Export controls, including transit/transshipment and end use controls

Examples of controlled items

1C353 Genetic elements and genetically modified organisms, as follows:

a. Genetically modified organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity of organisms specified in 1C351.a., 1C351.c, 1C351.e. or 1C354;

b. Genetically modified organisms or genetic elements that contain nucleic acid sequences coding for any of the "toxins" specified in 1C351.d. or "sub-units of toxins" thereof.

Technical Notes:

1. Genetically-modified organisms includes organisms in which the genetic material (nucleic acid sequences) has been altered in a way that does not occur naturally by mating and/or natural recombination, and encompasses those produced artificially in whole or in part.

2B352 Equipment capable of use in handling biological materials, as follows:

a. Complete biological containment facilities at P3, P4 containment level;

1C351 Human and animal pathogens and "toxins", as follows:

a. Viruses, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:

1. African horse sickness virus;

2. African swine fever virus;

3. Andes virus;

4. Avian influenza virus, which are:

a. Uncharacterised; or

b. Defined in Annex I(2) EC Directive 2005/94/EC (OJ L 10 14.1.2006 p. 16) as having high pathogenicity, as follows:

1. Type A viruses with an IVPI (intravenous pathogenicity index) in 6 Week old chickens of greater than 1,2; or

2. Type A viruses of the subtypes H5 or H7 With genome sequences codified for multiple basic amino acids at the cleavage site of the haemagglutinin molecule similar to that observed for other HPAI viruses, indicating that the haemagglutinin molecule can be cleaved by a host ubiquitous protease;

5. Bluetongue virus;

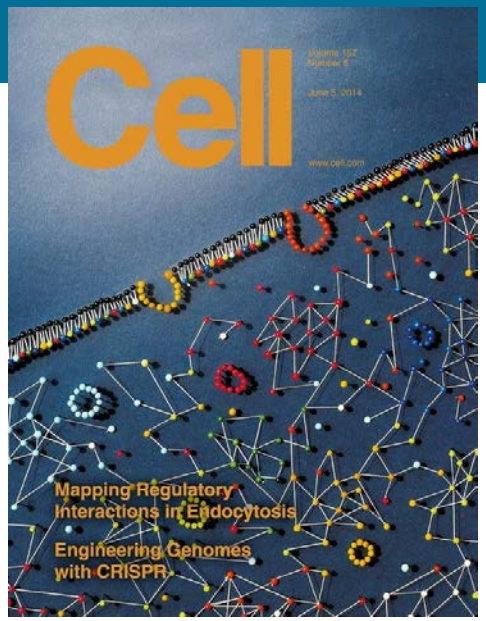
6. Chapare virus;

7. Chikungunya virus;

8. Choclo virus;

Connection to research

- Publications
- Exchange of material
- Ordering research equipment/materials
- Visiting symposia/international collaboration



- Fundamental versus applied research
- Exemptions:
  - Basic scientific research
  - Public domain
  - Patents

GENERAL TECHNOLOGY NOTE (GTN)

(To be read in conjunction with section E of Categories 1 to 9.)

The export of "technology" which is "required" for the "development", "production" or "use" of goods controlled in Categories 1 to 9, is controlled according to the provisions of Categories 1 to 9.

"Technology" "required" for the "development", "production" or "use" of goods under control remains under control even when applicable to non-controlled goods.

Controls do not apply to that "technology" which is the minimum necessary for the installation, operation, maintenance (checking) or repair of those goods which are not controlled or whose export has been authorised.

N.B.: This does not release such "technology" specified in 1E002.e., 1E002.f., 8E002.a. and 8E002.b.

Controls on "technology" transfer do not apply to information "in the public domain", to "basic scientific research" or to the minimum necessary information for patent applications.

Royal Academy of Science

"(…) the public should be able to trust researchers and others who engage in knowledge acquisition to assess whether their results can be misused for criminal or terrorist purposes. The responsibility for making that assessment lies mainly with researchers and other parties in the knowledge chain. (…)

The ability to advise on research with potential dual-use aspects requires knowledge and expertise in multiple areas (the science involved, laboratory security, and national and international threat analyses). (…)

(…) The Committee proposes establishing a separate Advisory Committee: the Biosecurity Advisory Committee for Research in the Life Sciences."

Procedures

- Classification request (indelingsverzoek)
  - Is an export license required?

- Sounding procedure (sondage)
  - Would I get a license under these circumstances?

- License application (vergunningaanvraag)
  - Formal application, 6-8 weeks processing time

- Sanctions (Russia, Iran, Syria)
- ‘Export’ without a license: penalty
- More information (in Dutch): rijksoverheid.nl/exportcontrole
  “Handboek Strategische Goederen”

Facilitate – export controls sounding procedure

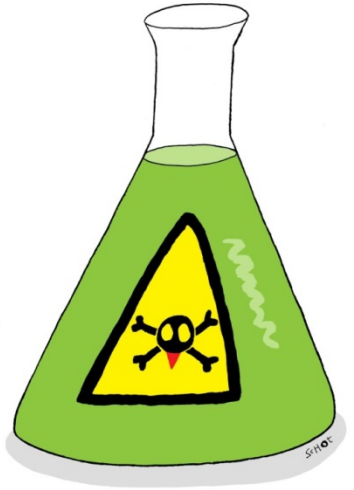
- Early awareness of possible risks

- Assessment by Minister of International Trade, involves:
  - Intelligence and security services
  - additional expertise when necessary (e.g. Life sciences)

- Not mandatory, however:
  - Ultimate authorisation builds on previous advice
  - Early awareness of possible concerns
  - Possibility to identify the need for additional risk-management and monitoring during scientific process

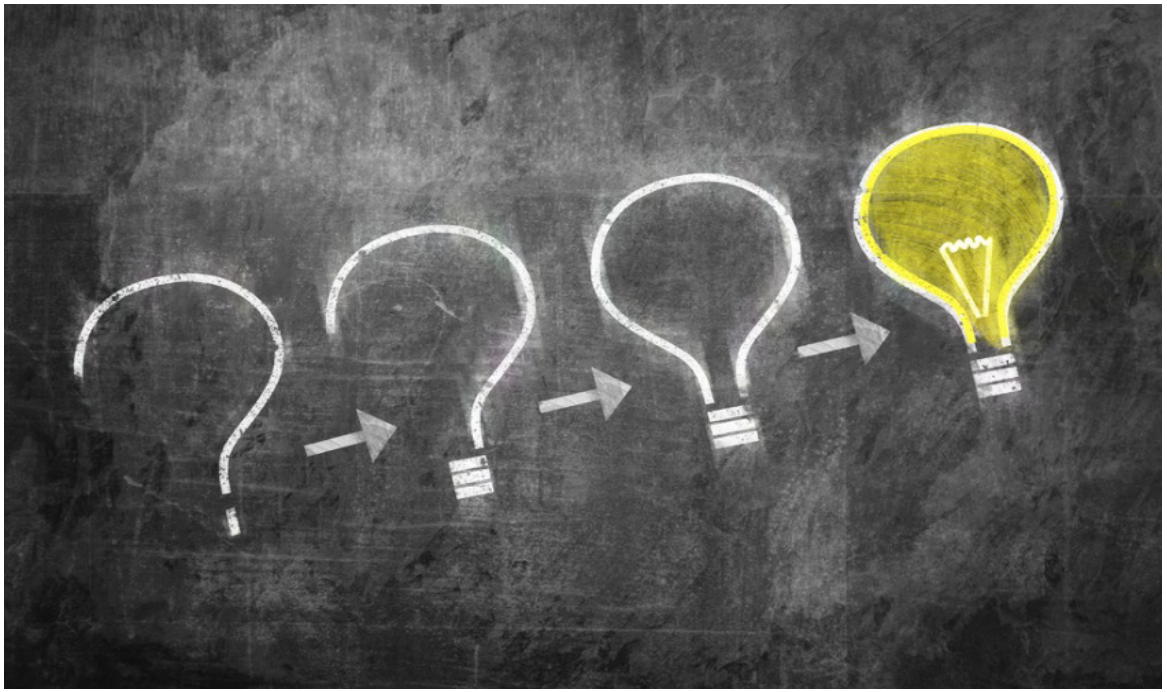
Philosophy and principles of Dutch Export control

- Compliance with international commitments
- Balance between security and science/public health/trade
- Bottom up approach:
  - research institutes responsible for their own projects
  - government guides and enforces when appropriate
  - dialogue
- Proportionality of administrative burden versus risk
- Important values: free science and innovative economics
- Build on existing structures



Thank you very much for your attention!

Questions?



Example of foreign guidance

	Technology Readiness Level	Description	Permit Required
Research and Development	1	**Review of Scientific Knowledge Base** • Research at this level would be "Basic Scientific Research". • The export or supply of technology would not require a permit.	No
	2	**Development of Hypotheses and Experimental Designs** • Research at this level would be "Basic Scientific Research". • The export or supply of technology would not require a permit.	No
	3	**Target/Candidate Identification and Characterisation of Preliminary Candidate(s)** • Research at this level may no longer be "Basic Scientific Research". • The export or supply of technology may require a permit.	Maybe

Example of foreign guidance

Testing and Demonstration	4	**Candidate Optimisation and Non-Good Laboratory Practice In Vivo Demonstration of Activity and Efficacy** • Research at this level could be "Basic Scientific Research", but may be closer to applied research. • A permit may be needed for technology that is deemed "required" and is not "basic scientific research".	Maybe
	5	**Advanced Characterisation of Candidate and Initiation of Good Manufacturing Practice (GMP) Process Development** • Research at this level would usually be applied or experimental research. • A permit may be required for the supply of technology and the export of any goods and technology.	Yes (if no exemptions apply)
	6	**GMP Pilot Lot Production, Therapeutics Goods Administration Registration, and Phase 1 Clinical Trial (s)** • Research at this level would usually be applied or experimental research. • A permit may be required for the supply of technology and the export of any goods and technology.	Yes (if no exemptions apply)

Example of foreign guidance

Production and Deployment	7	**Scale-up, Initiation of Good Manufacturing Practice Process Validation, and Phase 2 Clinical Trial(s)** • Research at this level would usually be applied or experimental research. • A permit may be required for the supply of technology and the export of any goods and technology.	Yes (if no exemptions apply)
	8	**Completion of GMP Validation and Consistency Lot Manufacturing, Pivotal Animal Efficacy Studies or Clinical Trials, and TGA registration of good** • Research at this level would usually be applied or experimental research. • A permit may be required for the supply of technology and the export of any goods and technology.	Yes (if no exemptions apply)
	9	**Post-Licensure and Post-Approval Activities** • Research at this level would usually be applied or experimental research. • A permit may be required for the supply of technology and the export of any goods and technology.	Yes (if no exemptions apply)

Thesis 1

- License requirements infringe the fundamental right of academic freedom.

Thesis 2

- Dual-use scientist don’t take their responsibility when it comes to biosecurity.

Thesis 3

- Applying for an export license is unnecessary; The enforcement authorities don’t know anything about microbiology anyway.