Biosecurity in Denmark: Training, education and outreach

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Single Danish government agency covering biosecurity and biopreparedness

Lab Division

Director

Operations Division

Policy Division

24/7 Laboratory

24/7 Field Investigation Capacity
Centre for Biosecurity and Biopreparedness

**Biosafety**
- Aim: Protect people and environment from harmful biological agents.
- Focus: Accidental release.
- Scope: Only biological agents.

**Biosecurity**
- Aim: Prevent acquisition of components enabling production or use of biological weapons.
- Focus: Intentional incidents.
- Scope: Agents, equipment and intangible technology.

**Not covered by CBB**

**Covered by CBB**
Basis and principles for the Danish biosecurity system

Execution of national and international legislation
- Executive order 981
- Act of Parliament 474
- International regulation (BTWC and UNSCR 1540)
- Historical BW use

Balanced, proportional and appropriate governance
- Current threat characterisation
- Openness and engagement with public shareholders and scientists

Future threat characterisation
- Forming of mitigation strategies
- Common ground
- Compliance
- Improvement of CBB public services
Centre for Biosecurity and Biopreparedness
Staffing

- Senior medical doctors (specialists)
- Experienced field personnel (first responders)
- Research scientists

Dedicated communications and public relations staff
Control of dangerous biological materials and related materials in Denmark

License from CBB required for any institution (private or public) working with, manufacturing, storing or distributing components enabling production or use of biological weapons

- Biological agents
- Delivery devices
- Equipment
- Level 3 and above laboratories
- Technology (know how)

Annex 1 of the EU Council Regulation (EC) No 388/2012
Australia Group common control list

"Related materials: ...technology ... which could be used for the design, development, production or use of ... biological weapons and their means of delivery"
UNSCR 1540
Requirements for a license

Mandatory elements

• Legitimate purpose
• Security
  • Vulnerability assessment
  • Security plan
  • Security procedures
• Designated, local biosecurity officer
  • Mandatory training at CBB

Control & sanctions:
• Inspections
• Withdrawal of license
• Penal sanctions
Examples of CBB communication activities

Made possible by dedicated communications and public-relations staff!
Examples of CBB communication activities

- Web page in Danish and English: biosikring.dk
- Activity on social media
- Yearly reports
- Regular newsletters for security officers
- Publications in peer-reviewed international journals:
  - Research work
  - Policy
- Workshops
- Promotional material
- Customer satisfaction questionnaires
Teaching at universities: Why?

- Raise awareness about dual-use issues in science.
- Raise awareness about scientific social responsibility.
Teaching at universities: Who?

Main Danish Universities reached in 2013:
• Danish Technical University
• Copenhagen University
• Aalborg University

Examples of reached fields:
• Veterinary science
• Food hygiejne
• Microbiology

• Physics
• Chemistry

Bachelor as well as master students, and PhD students
Teaching at universities: How?

Course material purpose-made to fit audience.

Messages based on very concrete issues.

Dialogue-based sessions with interactive case stories.

Wanted: Active and objective discussions with students.

Fostering arguments rather than opinions.

Limits to freedom?

1. There should be no limits for scientific freedom.
2. The existing ethical rule sets and legislation is sufficient; no more regulation is needed of science.
3. The potential for misuse should be evaluated at the start of all scientific projects.
   a) Researchers themselves are best qualified to do this.
   b) Should be done by authorities.

Why are biological weapons forbidden?

Do not discriminate (can not be controlled).

Case: The personal responsibility

- You are a student or scientist in a microbiological lab.
- The lab works with dangerous (controlled) human pathogens.
- You have a good collaboration with, and great trust in, your supervisor.
- Recently, he's changed:
  - Sensitive about work
  - Works alone at night
- You are worried.
- What do you do?

- Nothing.
- Take initiative, talk with him, express concern.
- Tell the lab chief.

A true story

- First letter 7 days after 9/11.
Teaching at universities: Challenges

Biosecurity is generally not part of the obligatory course work.

Therefore: It's necessary to actively engage Universities and vocational schools.

Approach: Convince University partners of benefits for them from CBB lectures.
- Eg as part of education in science ethics / scientific misconduct areas.

Typical package:
- 2 lectures, each ~1h
- Separated by short break

Resource-intensive Full-time activity

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Teaching at universities: Advantages

If material is selected according to target audience, then:

• relevance of biosecurity
• complex nature of dual-use situations in science
• importance of personal responsibility are
• very easy to communicate
• engaging subjects for essentially any science field and audience
Courses for first responders

CBB is also responsible for
• Courses for Danish first-response personnel

• Courses for national biosecurity officers
  • Obligatory for licensing

• National bioresponse plans and strategies
  • In collaboration with other first-response agencies, and health authorities
Scale of CBB activities
Training, education, outreach

In 2013:
• 9 university teaching sessions
• 17 courses for first-responders
• 3 biosecurity officer courses
• 17 other training, education and outreach activities

Sum total:
237 confrontation (face-to-face lecture) hours,
1291 participants;

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Future strategy for CBB training, education and outreach activities

• Still work in progress
• Prioritised
• Suggestions welcome

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Future challenges as regards training, education and outreach

Developing appropriate policies for evolving dual-use scenarios
- Human genome revolution
- Synthetic biology
- Applications of nanoscience in life sciences
- Etc

We as regulators do not automatically have the solutions. The process must involve shareholders as well as broader civil society.

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**Resurrecting live virus from sequence information**

"...there is no compelling reason to believe that wholly synthetic fragments could not be used to resurrect live smallpox virus. The estimated expense of synthesizing all of the necessary clones would currently be less than US$ 200,000, and this cost is likely to drop in the future."


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**250 human genomes can be assembled in 50 hours**

Future challenges as regards training, education and outreach

Raising awareness of dual-use risks in new technologies

Avoiding proliferation and avoiding facilitation of misuse

CBB vision:
• Securing that biotechnology only serves beneficial purposes, and is not intentionally used to do harm.
Summary

• The Centre for Biosecurity and Biopreparedness (CBB) is the Danish government agency covering biosecurity and biopreparedness.

• Training, education and outreach comprise central activities.

• Training and teaching activities proscribed by law or institutional course requirements:
  – Dedicated, local biosecurity officers at licensed institutions.
  – Danish first responders.
  – Certain fields at vocational schools (e.g., catastrophe management).

• Teaching and outreach activities towards shareholders and civil society.
  – Developing appropriate policies for evolving dual-use scenarios.
  – Fostering arguments rather than opinions.
    • Eg teaching at Universities.
    • Activity at social media.
    • Workshops

• We welcome suggestions for activities!
Thank you for your attention!

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