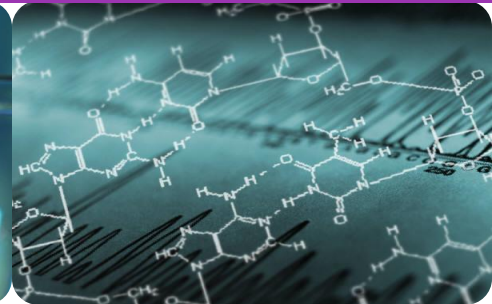




# Enhancing Biosecurity Culture: The Role of Biosecurity Education

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'Biosecurity and Biosafety: Future Trends and Solutions'  
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## Outline

- 1. Normative Foundations of Biosecurity Culture**
- 2. Education: What, Why, and How?**
- 3. Evaluating Impact and Promoting Sustainability**



## What Do We Talk about When We Talk about Culture?

- The institutionalised way of how things are done within a particular group which all group members have to comply with
- The standards on the basis of which humans understand the world, relates to their social/work environment, act and express themselves (Vickers)

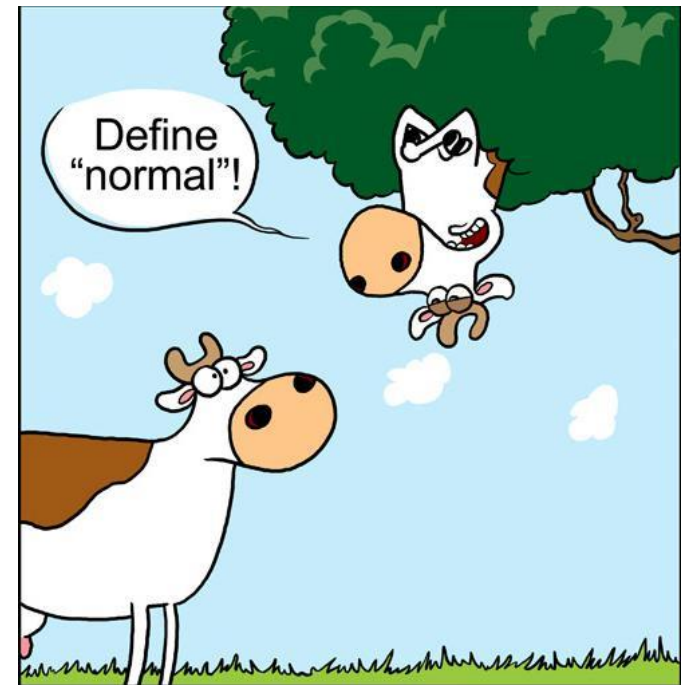


## Constraints on Human Action

- Logistical: **can/cannot do** (e.g. physical capacity, social status)
- Regulatory: **must/must not do** (e.g. laws and norms)
- Personal/Aspirational: **ought/ought not to do** (e.g. morals)

## The Power of Norms

- Norms: concrete, specific and tacit standards signifying what a particular social group considers (un)acceptable modes of behavior → a source of order
- What is perceived as ‘normal’





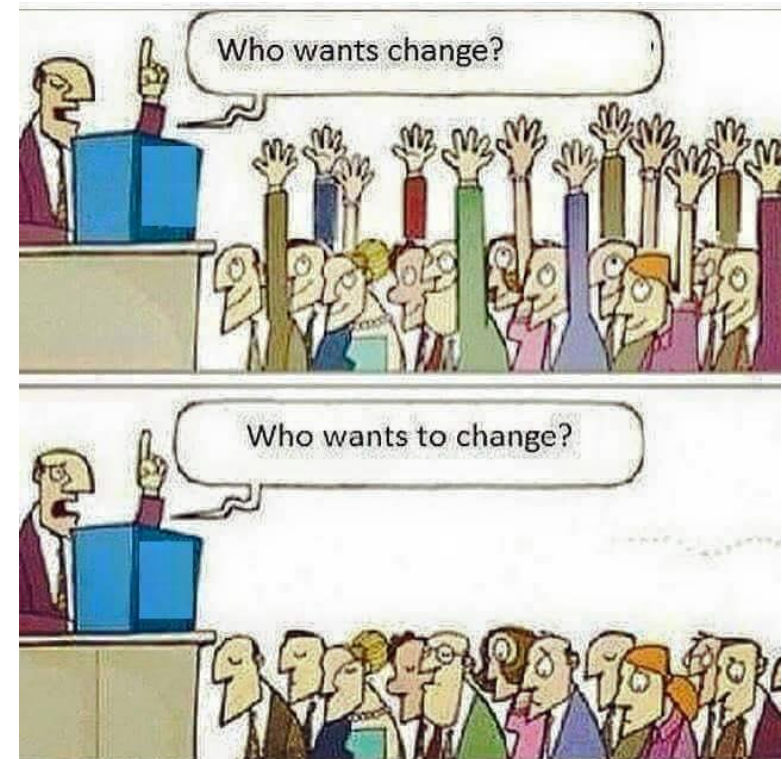
## Security Culture

- The assembly of **characteristics, attitudes and behaviour** of individuals, organizations and institutions which serves as a means to support and enhance security

IAEA, *Nuclear Security Culture*, 2008

## Culture Change

- Requires normative acceptance – e.g. buy-in by the group as a whole
- The new routines/practices/modes of behaviour need to be internalised
- The overall context within which the group operates needs to sustain, promote and reward the changed ethos





**Culture change**

**Actions to address the  
problem**

**A shared belief that the  
problem is significant**

**Awareness of a  
problem with existing  
practices**





# Seventh Review Conference: Biosecurity Education

## Article IV: National Implementation

13. *The Conference notes the value of national implementation measures...to:*

*(c) promote amongst those working in the biological sciences **awareness of the obligations** of States Parties under the Convention, as well as relevant national legislation and guidelines;*

*(d) promote the development of **training and education programmes** for those granted access to biological agents and toxins relevant to the Convention and for those with the knowledge or capacity to modify such agents and toxins;*

*(e) encourage the promotion of **a culture of responsibility** amongst relevant national professionals and the voluntary development, adoption and promulgation of codes of conduct; [Emphasis added]*

# International Recognition of the Need for Education

- US, NAS, Fink Committee Report, *Biotechnology Research in an Age of Terrorism* (2004), First Recommendation: **a need for education**
- US, NAS, Lemon-Relman Committee Report, *Globalisation, Biosecurity, and the Future of the Life Sciences* (2006), Fourth Recommendation: **a need for education**
- UK, Royal Society Report, *Brainwaves Module 3: Neuroscience, Conflict and Security* (2012), First Recommendation: **a need for education**
- German, Ethics Council Report, *Biosecurity – Freedom and Responsibility of Research* (2014), First Recommendation: **a need for education**

## What is Needed: A Central Role for Biosecurity

### **Move from deficiency of biosecurity awareness to a biosecurity norm throughout the life sciences**

- Introduction to biosecurity concept at pre-university (school) level
- University courses for all those in life sciences
- Continuing professional development for those in life sciences
- Funders to adopt policies requiring biosecurity knowledge for all work in the life sciences
- Journal and book publishers' policies
- National oversight systems
- Reporting to and engagement with relevant international agreements and organisations (e.g. BTWC, CWC, UNSCR 1540)



## Creating a Biosecurity Norm: A Biosecurity Textbook

- Jointly funded by Canada's Global Partnership Programme and the UK Global Partnership Programme
- An online book freely available online in English and Arabic
- Expected publication date: December 2015 at BWC MSP
- Designed as a training resource that can easily be adapted to different audiences and education settings
- Primary training audience: undergraduate students in the life sciences and related disciplines
- An initiative supported by governments: part of the essential strategy to promote biosecurity education and awareness



# Biosecurity Textbook: Content

## Threats and Responses

- Hostile misuse (e.g. bioterrorism)
- Key International Agreements (e.g. BTWC)
- Web of Prevention

## Role of Scientists

- Dual-use debate
- Role of industry international scientific organisations
- Biosecurity and natural disease outbreaks

## Biosecurity Education

## Role of Organisations

- Review of S & T: BWC ISU
- Engagement with law enforcement agencies: FBI, INTERPOL

## Role of States

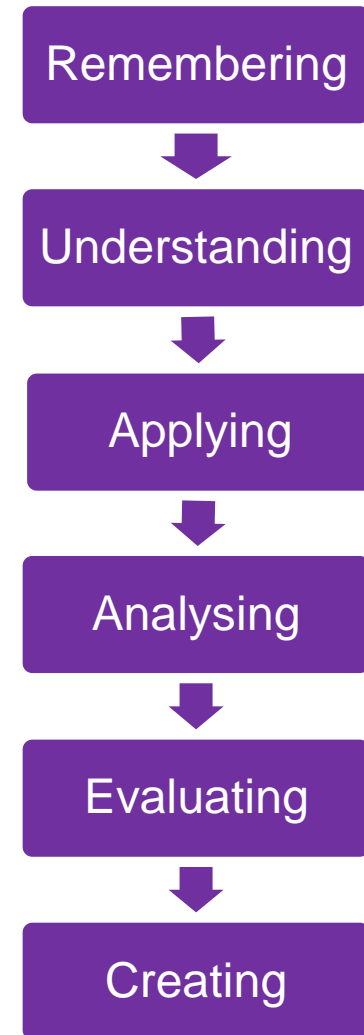
- Case Studies on
- Denmark
  - Jordan
  - South Africa
  - Canada



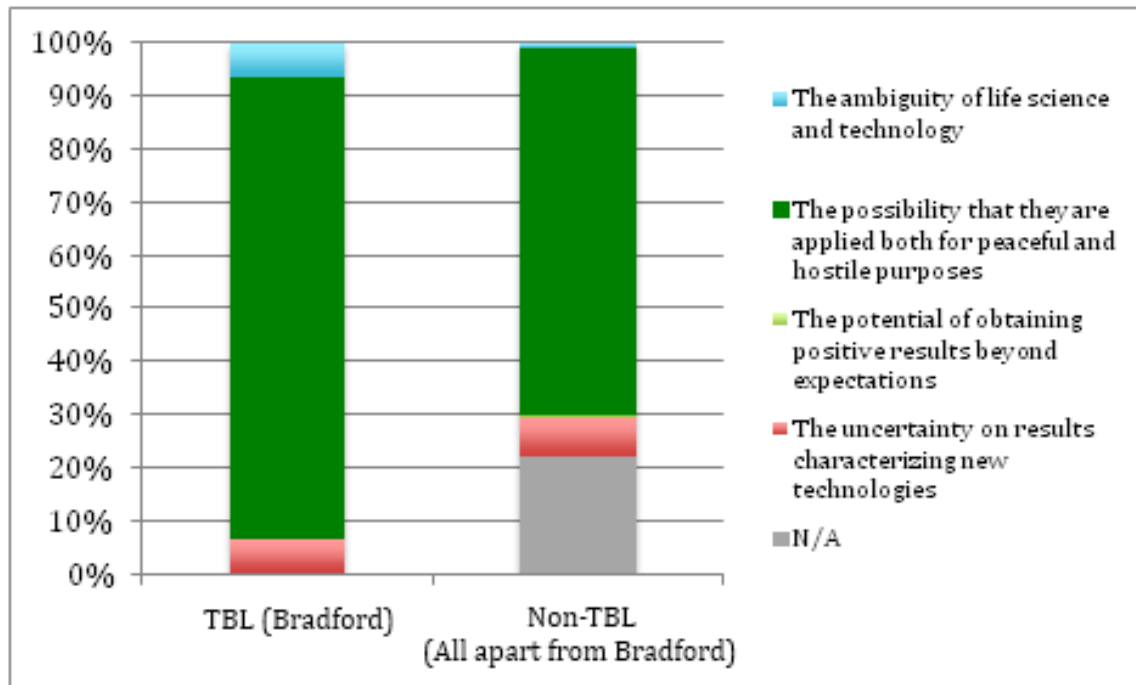
# Biosecurity Education: Strategy

## Team-Based Learning

- Active learning strategy: application of concepts rather than memorising concepts
- Easy to replicate without extensive prior training
- Easy to adapt to different training settings and for different purposes



## Teaching Biosecurity via Team-Based Learning



- *Bioethics and Responsible Research*, interactive seminar held at the University of Bradford (November 2012)
- 30 participants divided into 5 teams

“Which of these statements best defines the dual-use dilemma?”

## Achieving Sustainability

**Development of educational material → Training trainers →  
Supporting alumni in promoting education activities**

- EMR → Online Train-the-Trainer in Applied Dual-Use Biosecurity → REF Impact Survey (feedback from past participants)
- National Series → Implementation and Training Exercises → Education Activities in Georgia; National Education Network in Ukraine

## Utilising Cutting-Edge Pedagogy

- Expert-Level Scenarios based on Real-Life Cases;
- Group Presentations
- Team Based Learning at UG and PG level



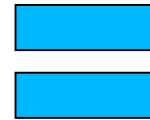
## Looking Ahead: Fostering Awareness



**Biosecurity  
Textbook**



**Biosecurity  
Education  
Handbook:  
TBL**



**Developing Competence  
Promoting Engagement  
Facilitating Collaboration**

**Training Trainers**



## Education = Culture Change?

- Biosecurity education is an essential but **not** sufficient condition for fostering biosecurity culture
- It is important that there is shared recognition among the group that biosecurity is needs to be strengthened, **especially** at managerial level
- The context within which the group operates needs to reward and emphasise relevant behaviours, practices and beliefs
- There is a need for a broader engagement and collaboration among all relevant stakeholders from individual to international level



**Thank you for the attention!**  
**Any Questions?**

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**<http://www.brad.ac.uk/bioethics/>**