

THE NATIONAL

DIVISION ON EARTH AND LIFE STUDIES

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Recent Developments in Biosecurity Education: Activities of the U.S. National Academies Related to Teaching and Learning about Responsible Conduct of Science, Dual Use, and Biosafety

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Advisers to the Nation on Science, Engineering, and Medicine

National Academy of Sciences
National Academy of Engineering
Institute of Medicine
National Research Council

- Education as the foundation for biorisk management/biosecurity
- Power of framing issues as responsible conduct of science
- Complements more specialized, professional education

Workshop on education about dual use issues, Warsaw, November 2009

- Convened at State Department request; BEP support
- International science organizations, IAP as co-sponsors; Polish Academy host; NAS committee responsible for report

Goals of the Workshop

- Survey the current state of education on “dual use” issues around the world
- Identify gaps, both in extent of existing education and in available materials
- Make recommendations about how to fill those gaps

Key Findings and Recommendations

- **Biosecurity education must compete with many other topics for space in the curriculum, so initial outreach is often best done via tailored modules that can be used as part of courses that address research integrity, biosafety, bioethics, or other topics related to the responsible conduct of science.**
- Use responsible conduct of science as the framework for addressing dual use issues.
- **Build networks of faculty and instructors through “train-the-trainer” programs, if possible in cooperation with scientific unions and professional societies and associations.**
- Use insights from research on learning and effective teaching to inform development of materials, and approaches to teaching students and preparing faculty



Represented Middle East/North Africa (MENA) Countries



- **Opportunity to create a network**
- **Context – general life sciences community**
- **Framing – dual use as part of responsible conduct**
- **Model: NAS Summer Institutes on Undergraduate Biology Education**
 - Residential
 - Hands-on experience; Work in teams
 - Emphasis on active learning
 - Commitment to apply in home institutions
 - Follow-up – key to sustainability
- **Partnering with Bibliotheca Alexandrina and TWAS**



Pilot Educational Institute in the MENA (cont)

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SCHEDULE AT-A-GLANCE

EDUCATIONAL INSTITUTE ON RESPONSIBLE RESEARCH WITH INFECTIOUS DISEASES: ENSURING SAFE SCIENCE IN THE 21st CENTURY - AQABA, JORDAN, SEPTEMBER 2012

FRIDAY SEPT 7 FACILITATOR TRAINING DAY	SATURDAY SEPT 8	SUNDAY SEPT 9	MONDAY SEPT 10	TUESDAY SEPT 11	WEDNESDAY SEPT 12	THURSDAY SEPT 13
	BREAKFAST 07:00					
BREAKFAST 08:00	Theme 1: The development of professionalism in science PARTICIPANTS Careers in science: Pathways and Inspirations	Theme 2: Conducting research responsibly CONTENT 2 - Research with animals and human subjects (2a) Introducing a new virus in the field (2b) The Guatemala syphilis studies	Theme 3: Being part of the responsible scientific community CONTENT 3 - Collaborative research; Authorship and publications; Peer review (3a) The Darsee affair (3b) Who is an author?	CONTENT 4 - Research with dual use potential (4) Powerpoint discussion	GROUPS PREPARE FOR PRESENTATIONS	NEXT STEPS
Training 09:00	HIGHER EDUCATION in the MENA region: Country focus	PEDAGOGY 2 - Assessment and introduction to Active Learning	PEDAGOGY 3 - Active learning	CONTENT 5 - Biosafety concerns in research (5) Studies in H5N1 influenza virulence	GROUP PRESENTATIONS	DISCUSSION AND ADJURNMENT 10:00
		CONTENT 2 (cont) - Conflict of interest; Data management	CONTENT 3 (cont) - Mentor and trainee responsibilities			COMMITTEE AND FACILITATOR DEBRIEFING 11:00
LUNCH 13:00	PRAYER 12:30					DEPARTURES
	LUNCH 13:00					
Training 14:00	PEDAGOGY 1 - How People Learn	SMALL GROUP WORK Writing learning objectives and assessments	SMALL GROUP WORK Assessments and activities	SMALL GROUP WORK Activities and alignment	GROUP PRESENTATIONS	
	CONTENT 1 - A responsible scientist (1) Autism and the MMR vaccine		GROUP SHARE SESSION	GROUP SHARE SESSION		
	PRAYER 16:30					
	COFFEE BREAK 16:30					
	LARGE GROUP WORK Selection of topics for small group work	SMALL GROUP WORK Writing learning objectives and assessments (cont)		SMALL GROUP WORK Implementation of feedback from previous session	SMALL GROUP WORK Implementation of feedback from previous session	GROUP PRESENTATIONS
			FACILITATORS MEET 18:00			
WELCOME DINNER Introductions and administrative details 19:30	DINNER	DINNER	DINNER (on your own)	DINNER	FAREWELL DINNER	

COLOR KEY

PLENARY SESSIONS
GROUP WORK
MEALS
PRAYERS
FACILITATORS

- Very positive feedback
- Small grants enabled participants to implement Institute lessons
- Additional educational approaches in home institutions
- Reunion and assessment 7 months later



- **Report issued in June 2013**
- **Stand alone summary in English and Arabic**



- **Educational Institute in S/SEast Asia**
 - faculty from India, Pakistan, and Malaysia
 - with Academy of Sciences Malaysia
- **National bioethics curriculum in Algeria**
- **2nd MENA Institute in 2014**
 - Website at Bibliotheca
 - Translation of materials

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For more information:

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THANK YOU!

Note: All reports from National Academies available free as pdfs at www.nap.edu.