

*World Association of Veterinary Laboratory Diagnosticians
14th International Symposium*



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**The WHO laboratory network to enhance
laboratory biosafety and biosecurity
in developing countries**

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Epidemic and Pandemic Alert and Response



Outline



A. Past

B. Present

C. Future

WHO's public health mandate

- **WHO Constitution of 1948**

- "Attainment by all people of highest possible levels of health"

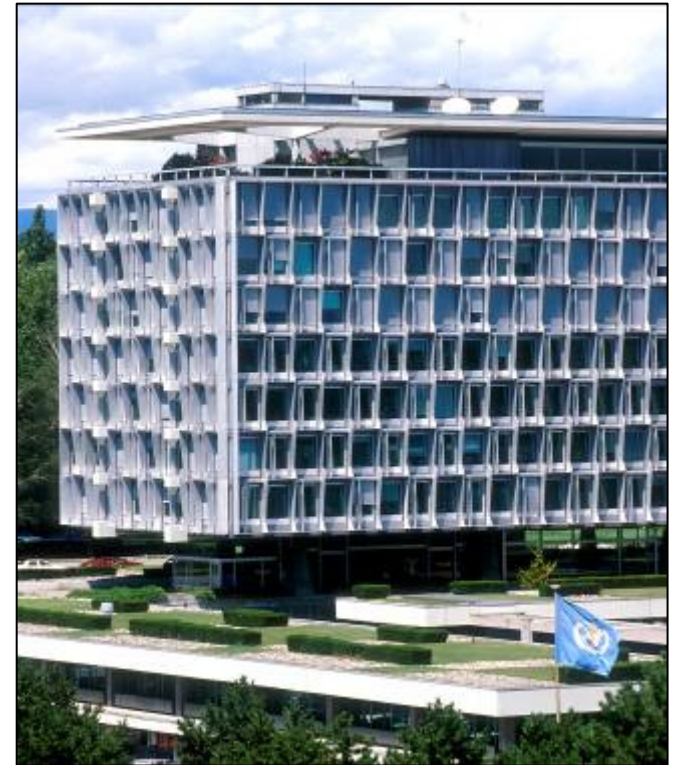
80's: WHO biosafety programme

Objectives:

To promote the use of safe practices in the handling of pathogenic microorganisms



- in the laboratory
- during transportation
- in field investigations
- in manufacturing facilities
- in health-care facilities



A sad trigger for safety awareness

LAI: the risk of sparking an epidemic...

SARS

- Singapore, 2003
- Taipei, 2003
- Beijing, 2004



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£££,

€€€

... and the threat of its
associated costs

Strengthen BIOSAFETY !
Reduce RISKS / COSTS of infection !



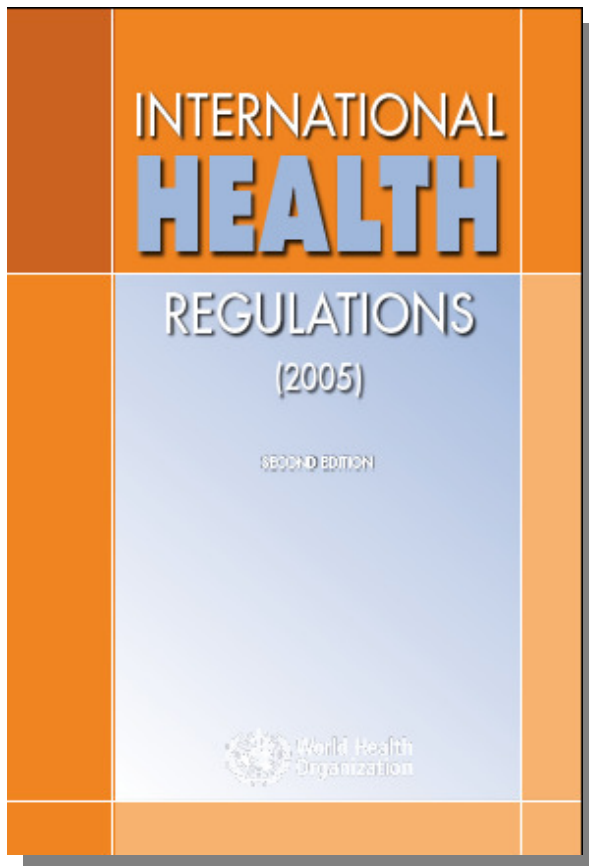
Taipei Airport

WHO's public health mandate pertaining to EPR/BDP operations

- **WHO Constitution of 1948**
 - "Attainment by all people of highest possible levels of health"
- **World Health Assembly resolution 55.16 (2002)**
 - "Global public health response to natural occurrence, accidental release or deliberate use of biological and chemical agents or radionuclear material that affect health"
- **International Health Regulations, resolution 58.3 (2005)**
 - "Prevention and control of the international spread of disease and public health risks"
- **World Health Assembly resolution 58.29 (2005)**
 - "Enhancement of laboratory biosafety"



International Health Regulations – IHR (2005)

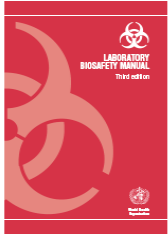


May 2005

<http://www.who.int/csr/ihr/en/index.html>

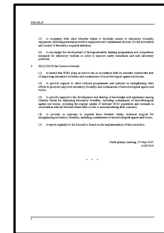
- **Legally binding** for all **193 WHO Member States**, international law
- Purpose:
"prevent, protect against, control and provide a public health response to the international spread of disease"
- Requires countries to **develop minimum core** national and international **surveillance** and **reporting capacities**

WHA 58.29



Enhance laboratory biosafety

May 2005



Member States to:

- review safety of labs, follow WHO guidance
- implement safety progs, follow WHO guidance
- enhance compliance with bs guidelines
- mobilize human and financial resources
- cooperate with other MS to facilitate access to PPE
- encourage dev of bs training progs and competency stds

WHO to:

- play an active role
- support other programmes and partners
- update relevant guidelines
- report to EB

WHO Laboratory biosafety manual

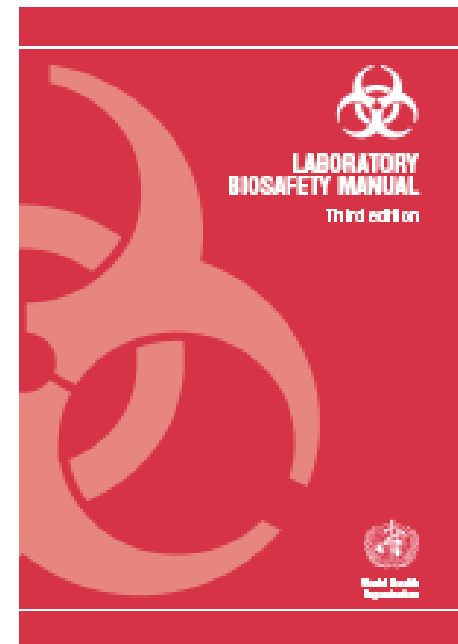
- Laboratory biosafety manual, 3rd edition, 2004

- translated into FR, SP, PO, CH, RU; it, jp, se, vt
- available on the web and in hard copies

Biorisk management:

- recommendations on how to work safely,
- addresses users and policy makers
- introduces laboratory biosecurity

▶ 75,686 page views of SP in Sept 07, 2nd only to the Disease Outbreak News page in EPR

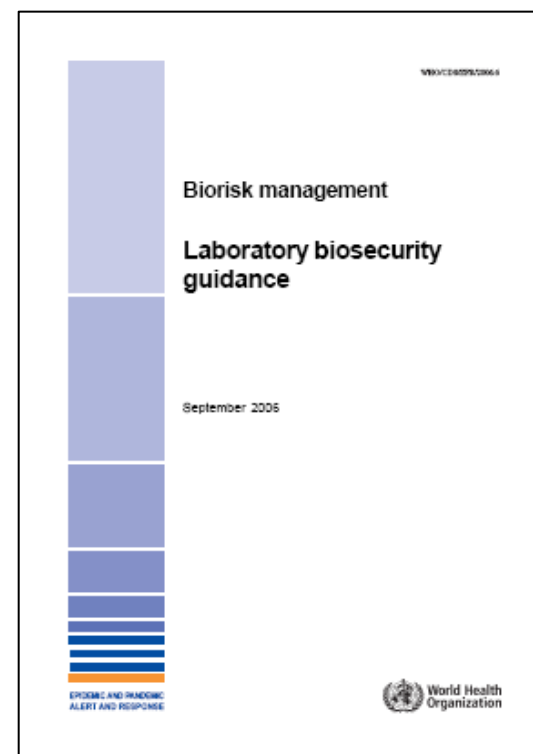
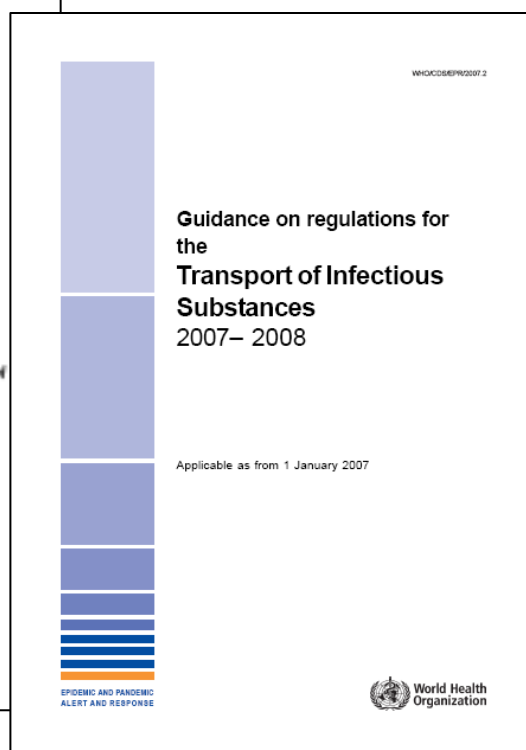
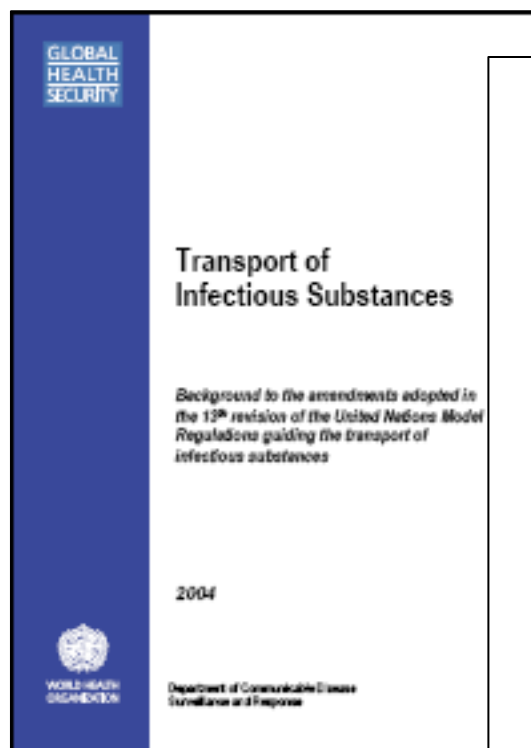


http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Other WHO biosafety and laboratory biosecurity publications

- translated into FR, SP

- only available in EN

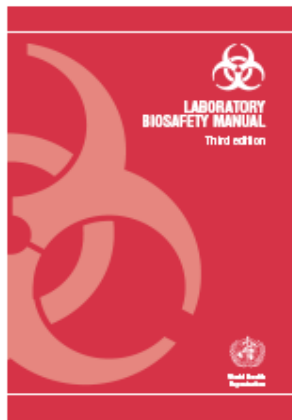


http://www.who.int/csr/resources/publications/biosafety/en/WHO_CDS_CSR_LYO_2004_9Final.pdf

http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_EPR_2007_2/en/index.html

http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_EPR_2006_6/en/index.html

Laboratory biosecurity is a complement of biosafety

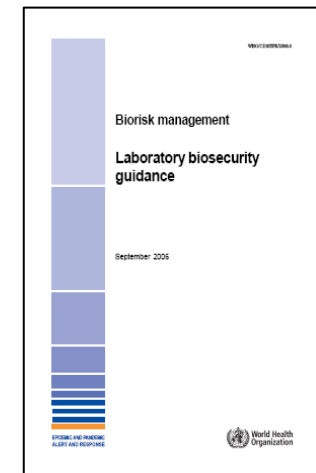


Laboratory biosafety describes containment principles, technologies and practices implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release.

http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Laboratory biosecurity describes the protection, control and accountability for valuable biological materials (VBM) within laboratories, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.

http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_EPR_2006_6/en/index.html



WHO Biosafety partners and networks

- **6 Regional Offices and HQ** ●●
- **5 Collaborating Centres** ●, **Biosafety Advisory Group**

Centers for Disease Control and Prevention (USA)

National Institutes of Health (USA)

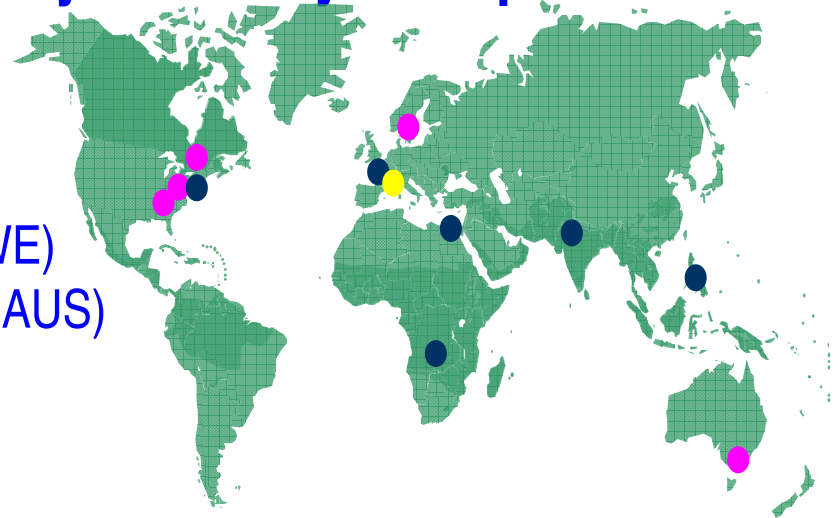
Public Health Agency of Canada (CAN)

Swedish Institute for Infectious Disease Control (SWE)

Victorian Infectious Disease Reference Laboratory (AUS)

- **Other partners**

ABSA, EBSA, A-PBA, ANBio, AfBSA...



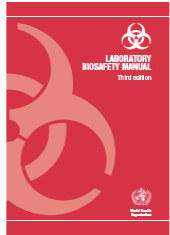
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B. Present

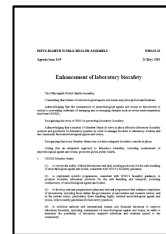
C. Future



Three years later: Where are we now?

Enhancement of laboratory biosafety

May 2005



Through engagement, communication, meetings, workshops, consultations, coordination of global efforts by various stakeholders:

2009:

- development / revision of legislation (e.g. Singapore / China)
- construction / renovation of laboratories (Brazil: 12 new BSL3)
- showing growing commitment to biosafety principles and practices
- role of laboratory management for biosafety: shift in responsibilities
- need for **training support** (TT, behavioural changes, etc.)

Biosafety in laboratories worldwide

- **No safety awareness, no safety training**
- **Virtually non-existent**
 - Safety awareness and good laboratory practice (GLP) worsen from central to peripheral labs
- **Few specific biosafety training programmes**
 - Occasionally with training on techniques
 - Very small part of quality system
- **Safety Officers not designated**
- **Safety Guidelines not available**
- **SOPs not available or not followed**
- **No mandatory immunization of lab personnel (TB, HBV, Typhoid fever)**



What are laboratories in the world like?

- **Emergency response plans**
 - Poorly defined spill-management
 - Post-exposure management (HBV/HIV)
- **Recording mechanism for laboratory acquired infections and other safety errors**
 - Minimal
- **Inadequate availability or use of personal protective equipment (PPE)**
- **Inappropriate waste disposal**



Constraints for improvement

- **Lack of awareness at highest level**
 - Policy / standards / regulatory
- **Inadequate resources and infrastructure**
- **Lack of sufficient technical expertise**
 - Practices
 - Construction
 - Validation
 - Documentation
- **Inadequate emphasis on training courses or exclusive training courses**
- **Little \$ to run and maintain containment laboratories**



Way forward – with support of IHR and WHA58.29

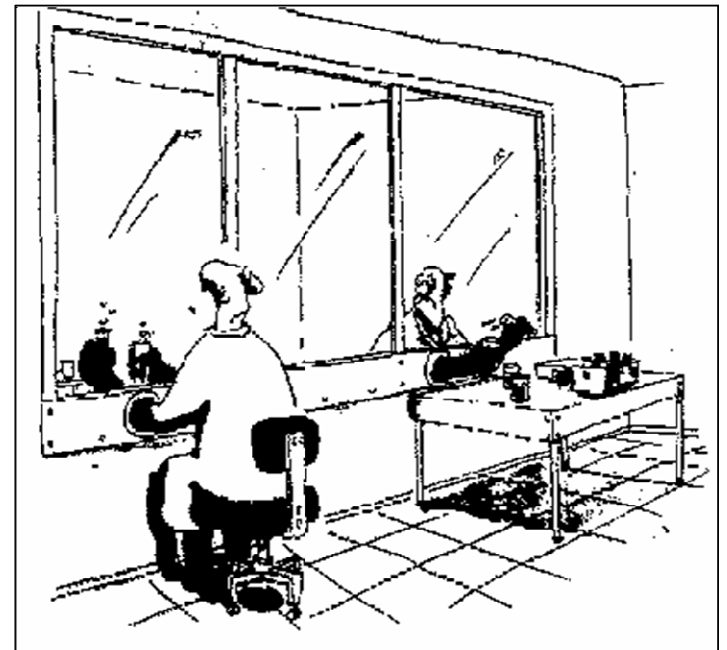
- **Advocacy / awareness for**
 - Development of national policy and
 - Allocation of resources
- **Technical support**
 - Construction
- **Training**
- **Policy**
 - National
 - Institutional
- **Independent review / international recognition / CEN**



Global trend: the appearance of BSL3 facilities

With all these new containment facilities:

- Are we actually increasing OR reducing the risks of infections?
- Are we ready to use these laboratories appropriately?
- Do we know how to construct them?
- Do we know what exactly we need?
- Do we know how to maintain them?
- Do we know how to certify them, and who will be accredited to certify them?



Global trend: the appearance of BSL3 facilities (cont'd)

- Do we know what running costs are going to be associated with them?
- Do we know where funding will come from?
- Do we expect to receive samples / materials that require such containment?
- Do we train our current / future staff appropriately?
- Do we expect to share agents / samples with other institutions or countries?
- Do we need to develop agreements on e.g. ownership of the samples / agents?
- Do we need to agree on codes of conduct? Dual use issues? Ethics?



WHO's support: Strengthen "Biorisk Management" in all Regions

Organize Biosafety and Laboratory Biosecurity
Awareness Raising Workshops



Typical structure of Biosafety and Laboratory Biosecurity Awareness Raising Workshops

Composition of national delegations:

- MoH, access to regulatory framework
- Director of central human public health laboratory
- Director of central animal health laboratory

Discuss:

1. Networking, training and human resources
2. Biorisk reduction management
3. Laboratory management and legislative framework
4. Physical environment: equipment, construction, design for human and animal research, containment

Develop: Regional plans, commitments, national plans

Train:

5. Transport of infectious substances

Biosafety and Laboratory Biosecurity Awareness Workshops

Where have we been already?



Asian-Pacific Region
REDI Centre, Singapore 2005
9 countries

Biosafety and Laboratory Biosecurity Awareness Workshops



**Central America,
Guatemala 2006
10 countries**

**South America,
Brazil 2005
9 countries**

Biosafety and Laboratory Biosecurity Awareness Workshops



**Eastern Mediterranean Region,
Iran 2006
22 countries**

Biosafety and Laboratory Biosecurity Awareness Workshops

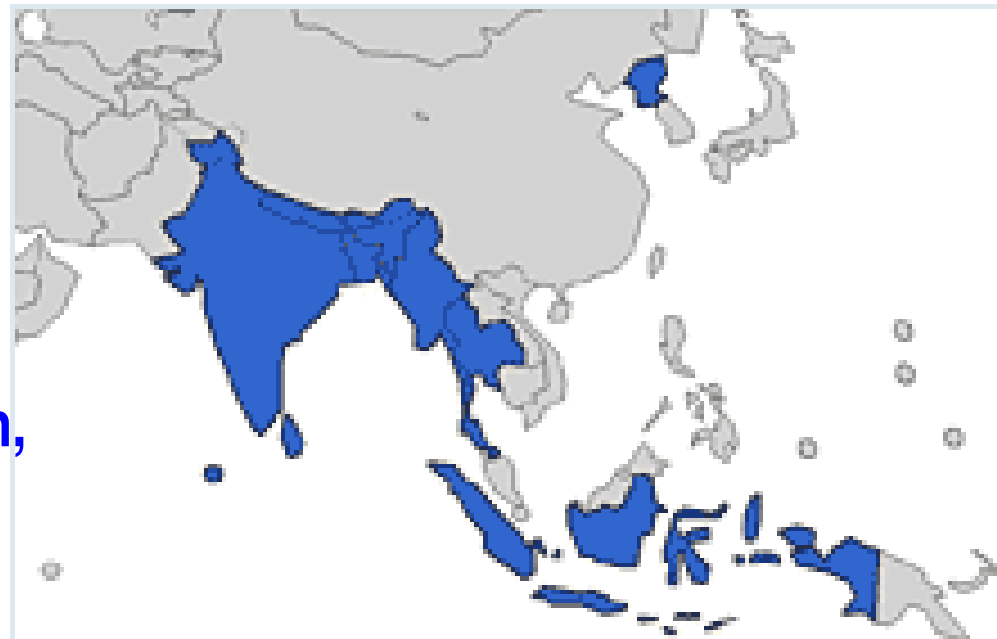
Francophone Africa
Kenya 2008
24 countries



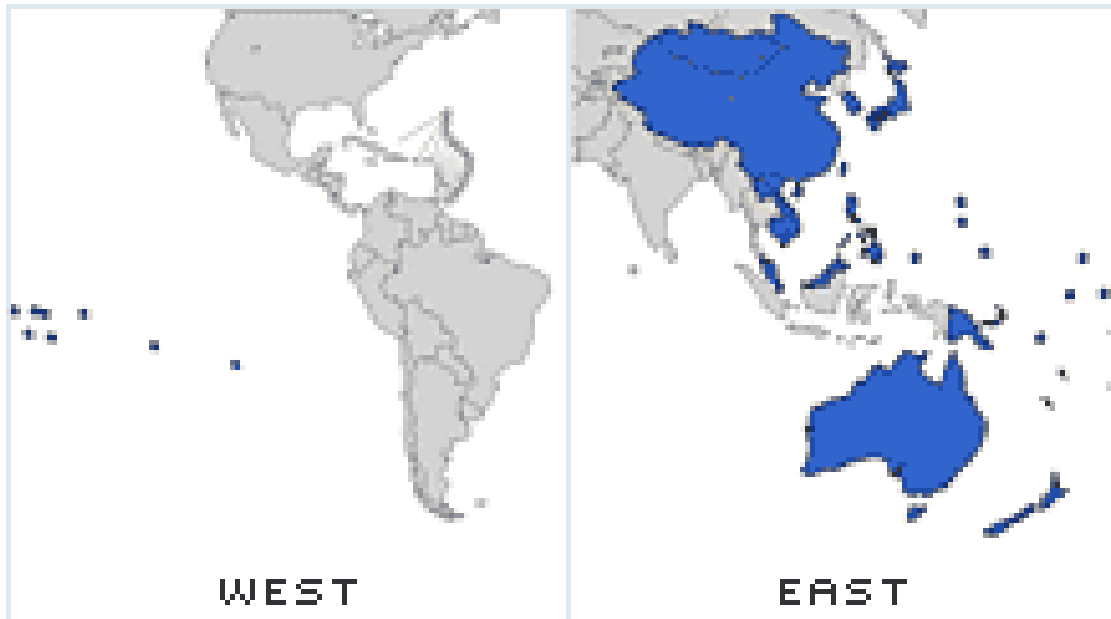
Anglophone Africa
Kenya 2007
21 countries

Biosafety and Laboratory Biosecurity Awareness Workshops

South East Asian Region,
Pune 2008



Biosafety and Laboratory Biosecurity Awareness Workshops



**Western Pacific Region,
Kuala Lumpur 2008**

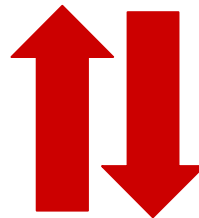
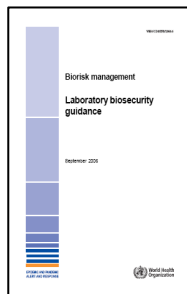
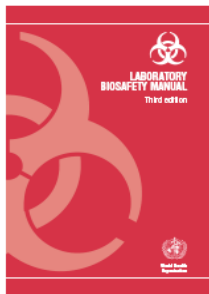
Biosafety and Laboratory Biosecurity Awareness Workshops



European Region,
2009.....

Support development of national policy

- "Biorisk management" approach: place responsibility on facilities to demonstrate that appropriate risk reduction procedures have been established
- Not prescriptive, but performance based: not 'how', but 'what'
- Everybody has a role
- Development of a "biosafety culture"



Top down – bottom up



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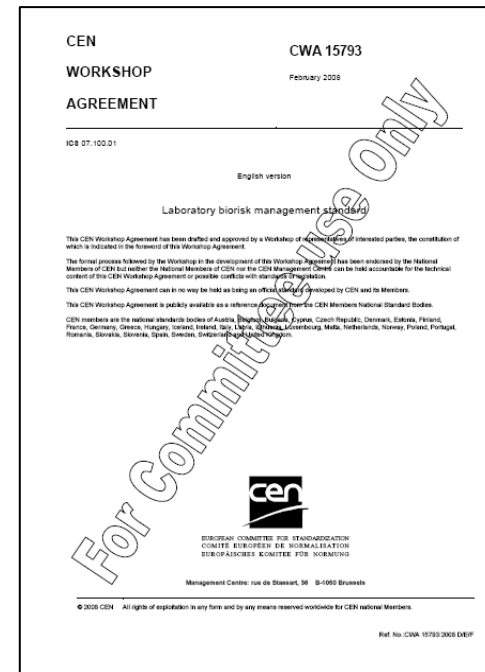
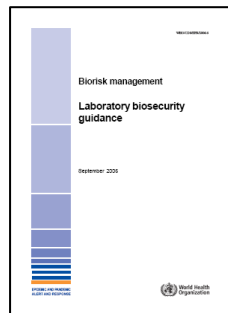
New tool to implement biosafety, laboratory biosecurity and biorisk management

International recognition and certification of laboratories:

CEN Laboratory Biorisk Management Standard CWA15793:2008

- Smallpox repositories
- New and renovated laboratories

based on:



Develop training materials and training opportunities

- Train the Trainers Manual
- Risk assessment guidelines
- Transport of infectious substances
- Appropriate use, operation and maintenance of biosafety cabinets
- Biosafety curriculum for undergraduate / graduate students



- Develop Regional self-sustainable trainers' network
- Develop a network of facilities to host training workshops
- Organize training for target groups

Next steps



- **Support countries to enhance laboratory biosafety**
 - CWA 15793 Laboratory Biorisk Management
- **Strengthen biosafety and laboratory biosecurity in the Regions**
 - Awareness Raising Workshops
 - Bs training for disease-specific programmes and networks
 - Interface animal health – public health
- **Train trainers for Regional, self-sustainable network**
- **Use, operation and maintenance of biosafety cabinets**
- **Discuss introduction of biosafety as scientific discipline into undergraduate / graduate studies**
- **Train on transport of infectious substances**
- **Coordinate global efforts, collaborate with global partners**



WHO: Enhance laboratory biosafety with support of IHR

Assist Member States understand, adopt and implement biorisk management strategies to minimize risks of infections through safe and secure practices in laboratory and transport environments

Thank you



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