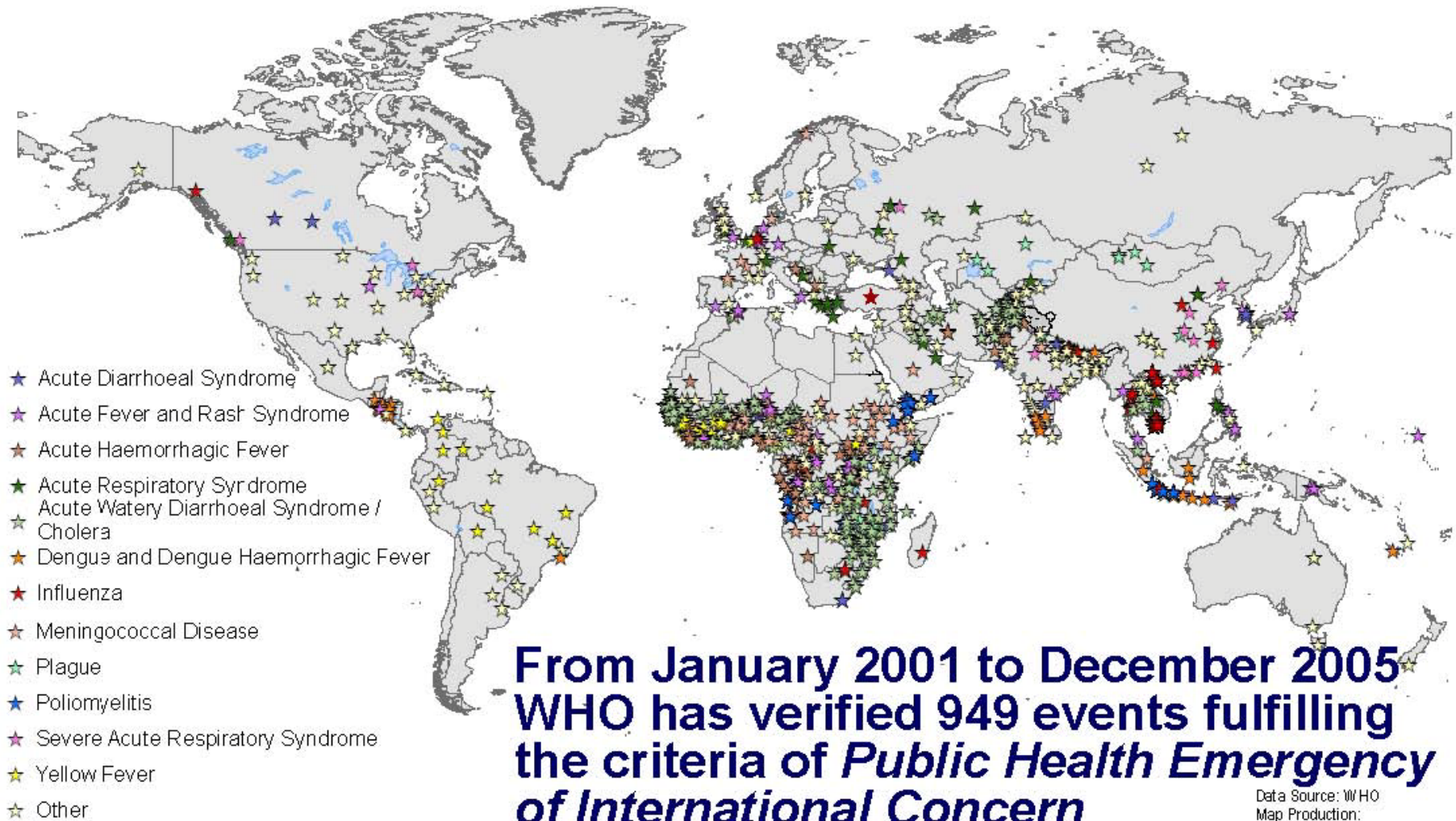




# *Life science research: opportunities and risks for public health*

E. Tuerlings, O. Cosivi, M. Chu, N. Previsani, C. Roth Department of Epidemic and Pandemic Alert and Response World Health Organization Geneva, Switzerland

# Actions Taken on Events



**From January 2001 to December 2005  
WHO has verified 949 events fulfilling  
the criteria of *Public Health Emergency  
of International Concern***



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: WHO  
Map Production:  
Public Health Mapping and GIS  
Communicable Diseases  
World Health Organization  
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# Laboratory Accidents and Bio-Risks



- **SARS: Singapore, 2003**
- **SARS: Taiwan, 2003**
- **SARS: China, 2004**
- **Tularaemia: USA, 2004**
- **Ebola: Russia, 2004**

# Bio-Risks from deliberate use

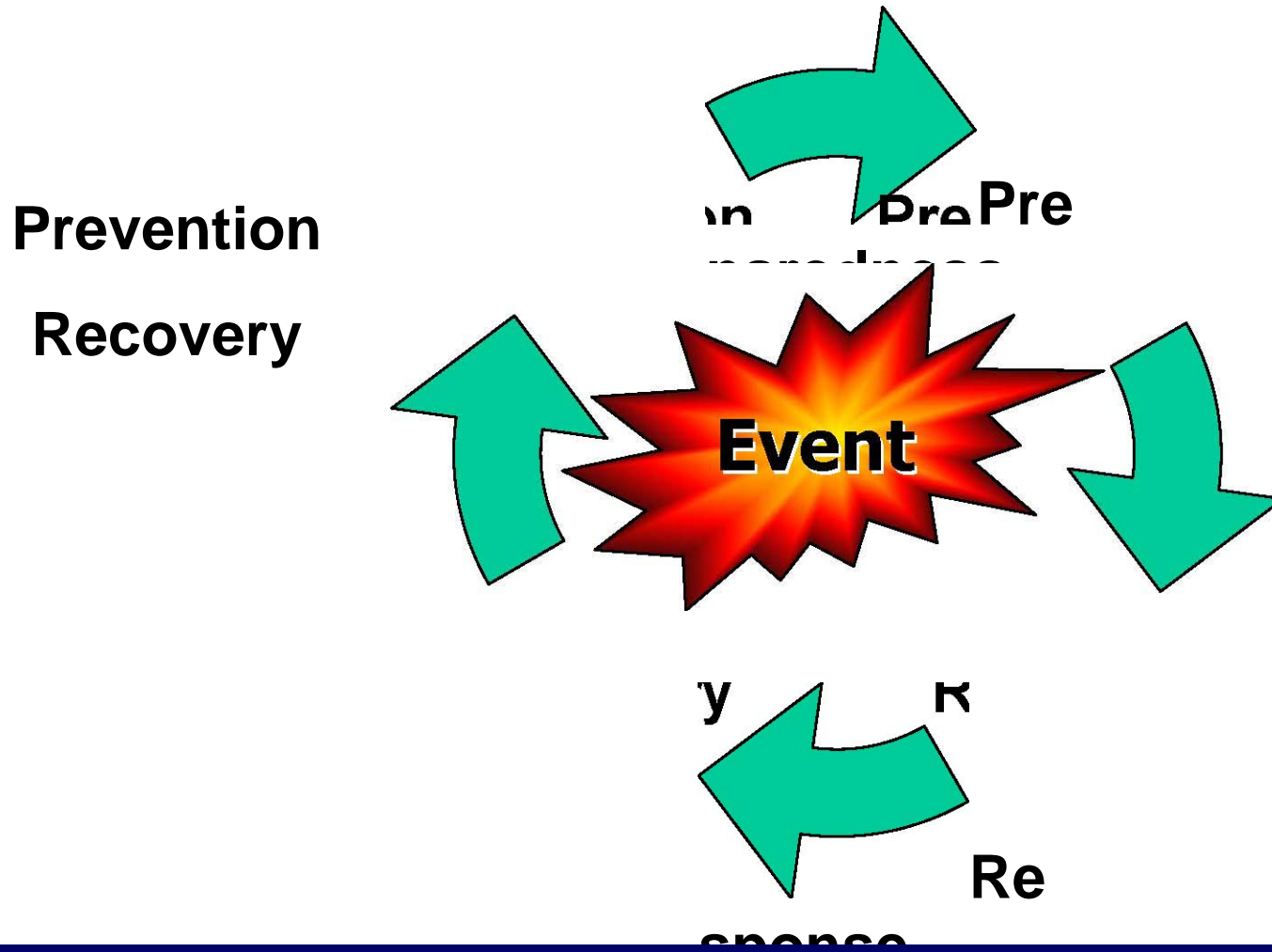


- *Low probability, high consequence*
- *New technology*

biotechnology and genetic engineering

# Bio-Risk

# Reduction



# Bio-Risk Reduction



# Response





Epidemic

Outbreak alert  
and



Intelligence  
response  
operations

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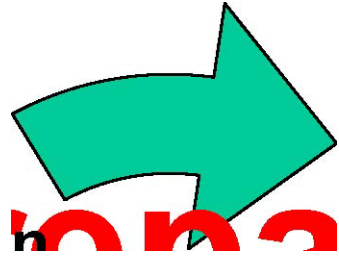
Public Health  
Response

Follow-up

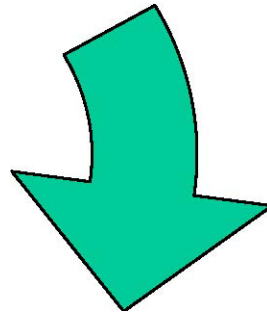
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Bio-R  
isk

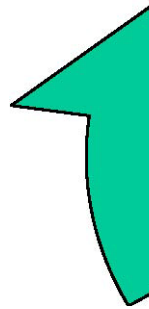
Reduction

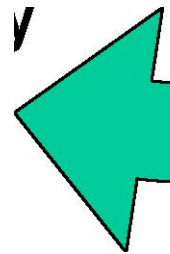


Prevention



Recovery





Resp  
onse

## Guidance for public health preparedness

*Managing the health risks of the deliberate use of biological and chemical agents or radioactive material:*  
**Guidance on capacity assessment**  
**being finalized**

# **Global Laboratory Networks Directory**

- **Identify and link assets of public health,**

**molecular typing and high consequence agent laboratory networks**

- **Develop a benefits package for networks such as training on biosafety,**

**standardized**

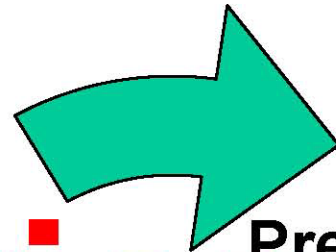
**developing surge  
capacity**

**templates,  
protection of  
intellectual  
property**

- **Coordinated  
multi-centre  
studies to  
encourage  
working  
together and**

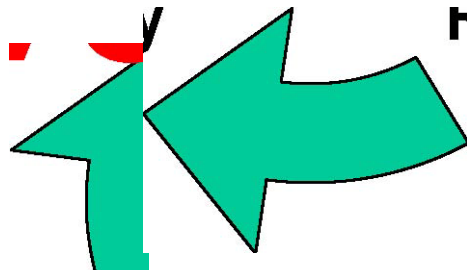
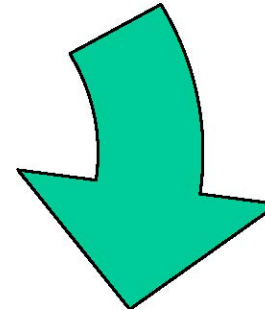
# Bio-Risk

**Prevention**  
**Reduction**  
**on**



Preparedness

Recovery



Re





# WHO Biosafety Activities

- *Laboratory Biosafety Manual, 3<sup>rd</sup> Edition (2004)*
- *Laboratory Biosecurity Guidelines*



- (being finalized)**
- **Coordination of global biosafety networks**
    - WHO Biosafety Advisory Group (BAG)
  - **UN Model Regulations**
    - Transport of infectious substances
  - **Visits to the smallpox repositories laboratories**

The implications of life science R&D for global health security

The importance of a public health perspective

- Life science R&D can have both **benefits and risks** for public health.
- **Control mechanisms** for

managing the risks could **hinder further development.**

- Strong **public confidence** must be maintained in science, and **scientific advice for policymaking** must be supported.
- The levels of **information and experience vary among WHO Member States.**

# WHO Statements on *Health–Science–Security*

- **World Health Assembly resolution WHA20.54 (1967)**


*“scientific achievements, and particularly in the field of biology*

*and medicine – that most humane science – should be used only for mankind’s benefit, but never to do it any harm”*

- **Genomics and World Health (2002). Report of the advisory committee on health research.**

*“The potential misuse of genomics for the purposes of biowarfare is of particular importance”.*

The biomedical research community should take “a much more proactive role in controlling the hazards associated with the misuse of genomics for biowarfare” as well as to examine “the risk–benefit ratios of some



*of its current genetic engineering procedures" and the adequate containment and monitoring of its work.*

agents or radionuclear material that affect health"

- **World Health Assembly resolution 55.16 (2002)**

"Global public health response to natural occurrence, accidental release or deliberate use of biological and chemical

# The implications of life science R&D for global health security

Phase 1 completed in  
2005\*

- Background paper  
"Mapping the issues"  
(available on the web)
- International network  
of individuals and

institutions

- • In-house network:
  - Epidemic and Pandemic Alert  
and Response
  - Ethics, Trade, Human Rights  
and Health Law
  - Research Policy & Cooperation:
  - Special Programme for  
Research and Training in Tropical  
Diseases

*Advisory Committee on  
HealthResearch (ACHR)*

\* Funded by the Alfred P. Sloan Foundation, New  
York, USA

WHO/CDS/CSR/LYO/2005.20

# Life science research: opportunities and risks for public health

Mapping the issues



World Health  
Organization

# The implications of life science R&D for global health security

## Contents

### 1. Introduction

- 2. Definitions and WHO involvement
  - 2.1 Some working definitions
  - 2.2 WHO involvement

### 3. Review of selected life science R&D, related techniques and their associated risks

- 3.1 Genetic engineering
- 3.2 Genomics, functional genomics and proteomics
- 3.3 Bioinformatics
- 3.4 Related techniques

#### 1. Opportunities and risks for public health

#### 2. Risks of misuse of life science R&D

- 5.1 Monitoring the risks by research
- 5.2 Monitoring the risks as a responsibility of individuals and scientists

#### 1. Conclusions and further considerations

#### 2. References

#### 3. Further reading



WHO/CDS/CSR/LYO/2005.20

# Life science research: opportunities and risks for public health

Mapping the issues



World Health  
Organization

# The risks for the public health community

- **Poorly designed controls would slow down the production of knowledge** that is beneficial for human health and welfare.
- **"Over-regulation"** could stifle research and the opportunities for

developing countermeasures, or be expensive to implement and **reduce the attractiveness** of certain areas of medicine.

- **Tightening control** (vetting publications, classifying research results) might **affect the conduct of life science research**, distort the fundamental mechanisms of disseminating scientific knowledge and endanger both the quality and quantity of research being done on public health issues and development of new medical products.



# Questions and challenges



- Are the current measures adequate to manage risks

**OR** are new measures needed?

- Would rules and regulations be able to manage

risks without impairing benefits of R&D?

- Is it realistic to expect consistency among the wide array of control measures suggested?



**Public health  
community  
should be  
aware of and  
actively  
participate in  
these  
discussions**

