BWC/MSP Meeting of Experts Geneva, 19 July 2004

Epidemic Alert & Response

Guénaël R. Rodier, Director,
Communicable Disease Surveillance and Response (CSR),

World Health Organization
Our world is changing

- We change the way we live
- Microbes evolve
- New threats emerge
We create successful tools, but ...  

- The microbial world adapts, becomes resistant to anti-infective drugs, develops new antigens that counter vaccines, and fully exploits new opportunities for emergence and epidemics.
New diseases emerge ...
Disease spread to new areas

Increasing occurrence of Human Monkeypox
Democratic Republic of Congo, 1970-2001


1970-1980:
- 48 cases

1981-1986:
- 338 cases

1996-2002:
- 1,705 cases

USA, 2003
- 1163 cases

W H O E P I D E M I C A L E R T A N D R E S P O N S E
Drug resistance develops

Malaria: Chloroquine failure rates, differences at the micro-level
New strains emerge

Epidemic meningococcal disease

- 700,000 cases in the past 10 years;
  10-50% lethality
  10-20% of survivors suffer permanent brain damage
- Emergence of W135 strain
  New trivalent vaccine (GSK)

Epidemic season 2003: 24,000 cases including 2,700 deaths
New diseases (re)emerge
Marburg Viral Haemorrhagic Fever, 1998-99

Figure 1. Democratic Republic of the Congo

Marburg Viral Haemorrhagic Fever, 1998-99
New diseases (re)emerge
Plague, Algeria, 2003

Plague outbreak, Oran, Algeria, 2003

18 cases / 1 death
New diseases (re)emerge

Nipah Virus Outbreak, Bangladesh, Feb 2004
New diseases (re)emerge
H5N1 HPAI, 2004

Laboratory confirmed human cases of influenza A/H5N1 infection in Thailand and Viet Nam by province (N=33)

Legend:
≥1 case

Data Source: WHO
Map Production: Public Health Mapping Team, Communicable Diseases (CDS)
### The microbial world is highly dynamic

#### Influenza pandemics* and recent outbreaks, 1918–2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Colloquial name &amp; subtype</th>
<th>Affected age group</th>
<th>No. deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918*</td>
<td>Spanish flu (H1N1)</td>
<td>all ages</td>
<td>40 million</td>
</tr>
<tr>
<td>1957*</td>
<td>Asian flu (H2N2)</td>
<td>&gt; 65 and under five</td>
<td>4.5 million</td>
</tr>
<tr>
<td>1968*</td>
<td>Hong Kong flu (H3N2)</td>
<td>&gt; 65 and under five</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>Swine flu (H1N1)</td>
<td>all ages</td>
<td>1</td>
</tr>
<tr>
<td>1997</td>
<td>Chicken flu (H5N1)</td>
<td>all ages</td>
<td>18</td>
</tr>
<tr>
<td>2003</td>
<td>Chicken flu (H7N7)</td>
<td>adult</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>Chicken flu (H5N1)</td>
<td>mean age: 16 years</td>
<td>22</td>
</tr>
<tr>
<td>?</td>
<td>Naturally occurring pandemics inevitable</td>
<td></td>
<td>?</td>
</tr>
</tbody>
</table>
Outbreaks strike everywhere

WHO EURO Surveillance and Response

**NORWAY**
- September 2001: Legionnaire's Disease - 19 cases, 2 deaths
- December 2001: Yellow Fever - imported, 1 case

**BELGIUM**
- December 2001: Yellow Fever - imported, 1 death

**YUGOSLAVIA**
- Kosovo: May 2001: Cholera - 53 cases
- Kosovo: November 2001: CCHF - 69 cases, 6 deaths

**BELARUS**
- May 2002: Shigellosis - 606 cases

**RUSSIA**
- Tatarstan: May 2001: Cholera - 53 cases
- Voronezh: December 2001: HFRS - 55 cases

**FRANCE**
- August 2002: Q Fever - 79 cases

**SPAIN**
- June 2001: Legionnaire's Disease - 745 cases, 1 death
- February 2002: Cholera - imported, 2 cases

**ITALY**
- June 2002: Measles - 368 cases, 3 deaths
- February 2002: Cholera - imported, 2 cases

**GREECE**
- April 2002: Measles - 53 cases, 3 deaths

**GERMANY**
- July 2001: Cholera - imported, 1 case

**DENMARK**
- May 2001: Meningococcal disease W135 - imported, 2 cases

**SWEDEN**
- May 2002: Salmonellosis - imported, 342 cases

**NORWAY**
- September 2001: Legionnaire's Disease - 19 cases, 2 deaths
- August 2002: Legionnaire's Disease - 116 cases, 3 deaths

**UNITED KINGDOM**
- February 2002: Measles - 50 cases
- August 2002: Legionnaire's Disease - imported, 1 death
- August 2002: Measles - 19 cases, 2 deaths

**FRANCE**
- August 2002: Q Fever - 79 cases

**SWEDEN**
- May 2002: Salmonellosis - imported, 342 cases

**GERMANY**
- July 2001: Cholera - imported, 1 case

**DENMARK**
- May 2001: Meningococcal disease W135 - imported, 2 cases

**SWEDEN**
- May 2002: Salmonellosis - imported, 342 cases

**GERMANY**
- July 2001: Cholera - imported, 1 case
Major epidemics may strike again

Influenza pandemic, 1918-1919

HIV/AIDS pandemic
Man-made threats ...

Accidental and deliberate release of infectious agents.

- Increased surveillance/research, biotechnology is widely available
- Increased risk for accidental release (e.g. SARS 2004)
- World tensions remain and the deliberate release of infectious agents is no longer a remote threat.
Some Landmarks

- **1992 Institute of Medicine**: Emerging Infections, Microbial Threats to Health in the United States.

- **1995 WHA Resolution**: Emerging diseases and drug resistance. Creation of WHO EMC Department.


- **2002 WHA Resolution**: Global public health response to deliberate use of biological and chemical agents.
Some Landmarks

■ 2003 WHA Resolution:
  - Influenza Pandemic Preparedness
  - International Health regulations (IHR)

■ 2003 Institute of Medicine: Microbial Threat to Health - Emergence, Detection and Response

■ 2004 WHA Agenda:
  - IHR
  - Smallpox
  - Avian Influenza
  - SARS
Strategy Summary

Epidemic Alert & Response

International Health Regulations

- Contain known risks
- Respond to the unexpected
- Improve preparedness

Global Partnership

WHO Epidemic Alert and Response
WHO Epidemic Alert and Response
Making use of WHO's unique global network

- 192 Member States
- HQ, Geneva
- AFRO, Brazzaville / Harare
- PAHO, Washington
- EMRO, Cairo
- EURO, Copenhagen
- SEARO, Delhi
- WPRO, Manila

- 141 Country Offices / Liaison Officers
- Sub-regional and specialised offices e.g. AFRO 5 SubReg, CAREC, …
The Fifty-fourth World Health Assembly,

Recalling resolutions WHA48.7 on the International Health Regulations, WHA48.13 on new emerging and re-emerging infectious diseases …

1. EXPRESSES its support for:

   ...  

   (3) collaboration between WHO and all potential technical partners in the area of epidemic alert and response, including relevant public sectors, intergovernmental organizations, nongovernmental organizations and the private sector;

   ...

Global health security: epidemic alert and response
Global Partnership

Partnership with other UN Organisations and major NGOs

- e.g. UNICEF, FAO, OIE, IFRC, MSF, MERLIN, ICMM etc.
Surveillance network partners in Asia
Containing Known Risks
Containing known risks

- Global agenda for influenza
- Meningitis surveillance and ICG
- Cholera Task Force
- Yellow fever and other VHF
- BSE/NvCJD surveillance
- Smallpox Advisory Committee
- Viral Haemorrhagic Fevers Networks
- Others
Containing known risks
WHO Global Influenza Programme

- First Global agenda for influenza
- Pandemic preparedness plan
- 50 years of global influenza surveillance
Containing Known Risks

Similarity of issues in prevention and control of influenza and smallpox

<table>
<thead>
<tr>
<th>Issue</th>
<th>Influenza</th>
<th>Smallpox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual vaccine production</td>
<td>insufficient (250 million doses)</td>
<td>insufficient (~ 300 million, scaling up)</td>
</tr>
<tr>
<td>Vaccine supply</td>
<td>finite, 6-8 month scale up time</td>
<td>finite, cannot be used in HIV-infected</td>
</tr>
<tr>
<td>Antiviral drug</td>
<td>limited, high cost</td>
<td>unlicensed, not on market</td>
</tr>
<tr>
<td>Risk</td>
<td>major pandemic thought inevitable</td>
<td>deliberately-caused outbreak thought high risk</td>
</tr>
<tr>
<td>Global surveillance/response partnership</td>
<td>Madagascar 2002 (under-funded)</td>
<td>Investigation of rumours (under-funded)</td>
</tr>
</tbody>
</table>
Responding to the Unexpected

- Contain known risks
- Respond to the unexpected

GLOBAL PARTNERSHIP
Responding to the unexpected
WHO Alert and Response Operations

- **24 hours / 7 days** a week, on call.
- ~200 events of potential international importance verified, in all countries, each year.
- 350 advices/assistance provided.
- 38 international outbreak response coordinated through the Global Outbreak Alert & Response Network (GOARN).
- Weekly **Outbreak Verification List** (~400 issues since 1997)
Responding to the unexpected
Risk Assessment and Field Operations (AFO)

- Team Coordination
  - Risk Assessment
    - Epidemic Intelligence
    - Verification
    - Assessment
  - Field Operations
    - Coordination
    - GOARN
    - Field Epidemiology
  - Logistics
    - Field support
    - ICG
    - Security

Situation Room
Responding to the unexpected
AFO Tools: GEMS

Advanced IT management tool to provide capacity for detection and coordinated response to public health emergencies

Platform for critical communication and data exchange between WHO, Member States, GOARN, others
Responding to the unexpected
AFO Standard Operating Procedures

WHO Country
WHO Region

AFO Intelligence and Assessment
Disease Specialists
AFO Operations
Director, ARO

Diverse Sources
Reports

Follow Up / Verification
Request for Assistance
Response Plan
Response Designation
Response Approval
Response Process

Initial Assessment
• Morbidity
• Atypical
• International
• Containability
• Need

Request for additional info
Final Assessment
• Morbidity
• Atypical
• International
• Containability
• Need

Response Plan
• Objectives
• Tasks
• Finance
• Recruitment
• STC ToRs
• Logistics

Response Designation
Response Approval

Daily List
OVL
Letter of Request
Response Designation
• Objective
• Team Lead
• Hazard Level
Response Plan
CSR Mission Letter
STC ToR
• Location
• Team
• Tasks
• Travel Dates
• Salary & PD

Responding to the unexpected
AFO Standard Operating Procedures

WHO Epidemic Alert and Response

Global Health Security

WHO Epidemic Alert and Response
Responding to the unexpected

AFO Tools: GPHIN
The Internet is an increasing source of outbreak-related information

- **MOH web sites** (National institutes, public health laboratories)
- **Media wires news** (AFP, Reuters, BBC etc.)
- **Electronic discussion groups** (ProMed, PACNET, etc.)
- **NGO web sites**
- **UN web sites** (UNHCR, UNICEF)
- **Others**
Responding to the unexpected

AFO: Global Epidemic Intelligence

Global Public Health Information Network

- Real time gathering of information related to outbreak events
- Multiple sources
  - GPHIN 39%
  - WHO Network 33%
  - Pro-MED 6%
  - Others (labs, NGOs…) 22%
Global epidemic intelligence
Gathering informal information during SARS

WHO China Office

Information sources
- Expert teams
- Laboratory networks
- Anonymous emails from public
- News media
- Internet
- Word of mouth

Verification of information through the Government
**ALERT & RESPONSE – DAILY SUMMARY – 11 June 2004**

Department of Communicable Disease Surveillance and Response (CSR)
World Health Organization (WHO), Geneva, Switzerland

*Working Document for WHO Staff Only*

<table>
<thead>
<tr>
<th>Disease/Syndrome</th>
<th>Location - onset - Epidemiological data</th>
<th>Decision and action</th>
<th>Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACUTE FEBRILE SYNDROME</strong></td>
<td>SAUDI ARABIA Jeddah</td>
<td>LAST INCOMING INFO</td>
<td>POINTS OF CONTACT</td>
</tr>
<tr>
<td>ID 1457-A90-SA</td>
<td></td>
<td>Enter on daily list 10 Jun 2004</td>
<td>HQ: R. Dayal-Dragon</td>
</tr>
<tr>
<td><strong>INITIAL REPORT: GPHIN</strong></td>
<td></td>
<td>According to GPHIN report, 85 cases,</td>
<td>RO: H. El Mahdi El Bashara</td>
</tr>
<tr>
<td><strong>GPHIN 10-Jun-2004</strong></td>
<td></td>
<td>including one death with 33 in</td>
<td>WR: El Fath Z. El Samani</td>
</tr>
<tr>
<td>(as Dengue Fever)</td>
<td></td>
<td>serious condition.</td>
<td></td>
</tr>
<tr>
<td><strong>FIRST REPORT</strong></td>
<td></td>
<td>Saudi Arabia is not a dengue epidemic</td>
<td></td>
</tr>
<tr>
<td><strong>VERIFIED cases: 85</strong></td>
<td></td>
<td>country. WR and CO requested for</td>
<td></td>
</tr>
<tr>
<td><strong>UNOFFICIAL cases: 85</strong></td>
<td></td>
<td>verification.</td>
<td></td>
</tr>
<tr>
<td><strong>DEATHS: 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LAST UPDATE: GPHIN 10-Jun-04</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VERIFIED cases: 85</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UNOFFICIAL cases: 85</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DEATHS: 1</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>NEW AFFECTED AREAS:</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>CONFIRMED BY:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LABORATORY:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLINICAL:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ACUTE HAEMORRHAGIC FEVER</strong></td>
<td>KENYA Bungoma</td>
<td>LAST INCOMING INFO</td>
<td>POINTS OF CONTACT</td>
</tr>
<tr>
<td>SYNDROME**</td>
<td></td>
<td>11-Jun-2004</td>
<td>HQ: Pierre Formenty</td>
</tr>
<tr>
<td>ID 1456-SY01-KE</td>
<td></td>
<td>P Formenty spoke to WR. Clinical features</td>
<td>RO: P. Luamba</td>
</tr>
<tr>
<td></td>
<td></td>
<td>include: high fever (&gt;=40C),</td>
<td>WR: P. Eniki</td>
</tr>
<tr>
<td></td>
<td></td>
<td>conjunctival hemorrhage, bleeding from</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ven madre site, chills and arthralgia,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>vomiting, malaise, back pain, pleo, fever,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>samples collected and will</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>be tested for VHF, non-specific Fever,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leptosplasia, etc.</td>
<td></td>
</tr>
</tbody>
</table>

**21.587 x 27.937 cm**
NOT FOR PUBLIC DISTRIBUTION

OUTBREAK VERIFICATION LIST
28 April 2004

World Health Organization (WHO), Geneva, Switzerland
Department of Communicable Disease Surveillance and Response (CSR), Communicable Diseases Cluster (CDS)
Tel +41 22 791 1111 (replace last four digits as required); Fax +41 22 791 4198
e-mail outbreaks@who.int

This list is distributed to a limited number of public health professionals in order to improve common awareness on reports and rumours of outbreaks which may have international implications. Please read the disclaimer below.

New or additional information on these or other outbreaks can be sent to the e-mail address above.

<table>
<thead>
<tr>
<th>Disease / Syndrome</th>
<th>Location and Date of onset</th>
<th>Source and Date of last update</th>
<th>Estimated number of cases and action taken</th>
<th>WHO Contact</th>
</tr>
</thead>
</table>
| INFLUENZA ID 1409-J10-11-EG | EGYPT Ismailia 27-Jan-2004 | WHO CC 28-Apr-2004             | The National Influenza Center in Egypt and the WHO Influenza Collaborating Centre in UK reported isolation of avian influenza strain A/H10N7 from two human specimens taken on 27 January and 16 February from two children who had febrile illnesses and recovered. The father of one child is a poultry merchant who travels frequently between Ismailia and Damietta. A/H10N7 (genetically closely related to the human viruses) has been isolated in 5 specimens from wild ducks sampled in a small market of hunted migrant birds in Damietta between 18-22 February 2004. Investigations are ongoing, including studies of possible contamination. | N. Tebeb              
telebn@enro.who.int        
Tel +202 276 3252            |
|                          |                            |                                |                                                                                                           | K. Stohr              
tosthrk@who.int             
Ext 2520                   |
| SEVERE ACUTE RESPIRATORY SYNDROME | CHINA Beijing, Anhui 25-Mar-2004 | WR. China 28-Apr-2004 | 2 probable cases and 7 persons under investigation, including one death. Chains of transmission are linked to two persons working for the National Institute of Virology in Beijing. Approximately 1,000 identified contacts currently under observation. | H. Oshitani          
oshitanih@wpro.who.int       
Tel +632 5289730        |
Communicable Disease Surveillance & Response (CSR)

HIGHLIGHTS

WHO consultation on priority public health interventions before and during an influenza pandemic
Full text
27 April 2004

WHO partnership to control meningitis outbreak
Full text
WHO Press Release, 6 April 2004

Avian influenza
Latest information

Severe Acute Respiratory Syndrome (SARS)
Latest information

DISEASE OUTBREAKS

Ebola haemorrhagic fever
Sudan - update 5
Full text

Ebola haemorrhagic fever
Sudan - update 1
Ebola haemorrhagic fever in south Sudan - update 2

26 May 2004

As of 26 May 2004, the health authorities of Yambio County have reported a total of 20 cases, including 3 deaths, of Ebola haemorrhagic fever (EHF) in Yambio, Western Equatoria, south Sudan. Ebola virus (sub-type Sudan) has been confirmed by laboratory tests at the Centers for Disease Control and Prevention (CDC), Atlanta, United States and the Kenya Medical Research Institute (KEMRI), Nairobi, Kenya.

The team from the WHO South Sudan Early Warning and Response Network (EWARN) and from WHO headquarters are continuing to work with the Crisis Committee to control the outbreak. Medecins sans Frontieres (MSF-France) is supporting the isolation ward and case management in Yambio hospital. CDC, as part of the Global Outbreak Alert and Response Network (GOARN) are providing further laboratory and infection control experts in the field. Other non-governmental organizations and churches are also working to contain the outbreak.

National authorities in the neighbouring countries of Democratic Republic of Congo (DRC) and in Uganda have enhanced surveillance in bordering areas (see map below). In DRC, a national team, supported by the WHO Country Office is alerting the local population, augmenting surveillance and performing active case finding. MSF teams in Province Orientale are also on the alert.

The boundaries and names shown and the designations used on this map do not imply the expression of an 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.
Global epidemic intelligence

AFO: January-June 2004 (n=191)

Other, 1 Jan 00 / 15 Jul 02:
9 smallpox rumours from 5 WHO Regions:
- 1 accidental exposure to Vaccinia virus
  (8 children hospitalized)
- 3 varicella outbreaks
- 1 measles outbreak
- 4 unknown etiology
Global epidemic intelligence

Information sources (1 Jan 2001 - 31 Dec 2003)

<table>
<thead>
<tr>
<th></th>
<th>Official</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verified</td>
<td>192 (87%)</td>
<td>290 (70%)</td>
<td>482 (76%)</td>
</tr>
<tr>
<td>Unverifiable</td>
<td>10 (5%)</td>
<td>76 (18%)</td>
<td>86 (13%)</td>
</tr>
<tr>
<td>No outbreak</td>
<td>17 (8%)</td>
<td>51 (12%)</td>
<td>68 (11%)</td>
</tr>
<tr>
<td>Total</td>
<td>219 (34%)</td>
<td>417 (66%)</td>
<td>636 (100%)</td>
</tr>
</tbody>
</table>
Responding to the unexpected
AFO Standard Operating Procedures

WHO Country
WHO Region
AFO Intelligence and Assessment
Disease Specialists
AFO Operations
Director, ARO

Initial Assessment
- Morbidity
- Atypical
- International
- Containability
- Need

Request for additional info

Follow Up / Verification

Final Assessment
- Morbidity
- Atypical
- International
- Containability
- Need

Request for Assistance

Response Plan
- Objectives
- Tasks
- Finance
- Recruitment
- STC ToRs
- Logistics

Response Designation
- Objective
- Team Lead
- Hazard Level

Response Approval

Response Process

Request for additional info

Response Plan

Letter of Request
- Objective
- Team Lead
- Hazard Level

CSR Mission Letter

STC ToR
- Location
- Tasks
- Travel Dates
- Salary & PD

Diverse Sources
Reports

Daily List
OVL

WHO EPIDEMIC ALERT AND RESPONSE
Global Outbreak Alert and Response Network
A “Network of Networks”

- > 120 institutions and other networks who mobilize and pool resources for outbreak alert and response

- Rapid identification, verification and communication of threats

- Appropriate technical assistance to affected Member state(s)

- Standard Operating Procedures and joint code of conduct

- Independent Steering Committee

- Secretariat in WHO
WHO Alert & Response
Global partnership for SARS control (1)

- International Federation of Red Cross
- Australian Collaborative Research Centre for Emerging Infectious Diseases
- Centers for Disease Control and Prevention (CDC), USA
- Centre for Health and Population Research (ICDDR, B), Bangladesh
- Centre for International Health, Curtin University, Australia
- EPICENTRE, Centre for Research in Epidemiology and Control of Emerging Diseases, France
- EPIET, the European Programme for Intervention Epidemiology
- Field Epidemiology Programmes in Australia, Japan and Thailand
- Global Emerging Infections System (GEIS), USA
- Health Canada
- Health Protection Agency (HPA), United Kingdom
- MSF - Belgium
- MSF - Switzerland
WHO Alert & Response
Global partnership for SARS control (2)

- Institut National de Veille Sanitaire, France
- Institut Pasteur, Paris, France
- Instituts Pasteur, Vietnam
- Kunskapscentrum för Mikrobiologisk Beredskap (KCB), Smittskyddsinstitutet(SMI), Sweden
- Leicester Royal Infirmary, North Manchester General Hospital, United Kingdom
- National institute of Infectious Disease, Japan
- Robert Koch-Institute, Germany
- University Hospital, Frankfurt, Germany
- National Institute of Public Health, Section for Infectious Disease Control, Norway,
- Southern Cone Surveillance Network and Epidemiology Department, MoH, Chile
- National Board of Health and Welfare and SIDA, Sweden
- UNDP
- Pacific Public Health Surveillance Network
Responding to the unexpected

AFO Tools: FIMS
Responding to the unexpected

Ebola haemorrhagic fever in Uganda, 2000-2001
Global Outbreak Alert and Response (GOARN)

122 International experts from 20 organizations under WHO coordination:

- Europe, North America, Japan (e.g. CDC, Health Canada, PHLS, EPIET, INVS, ISS, NIH Japan, )
- NGOs (e.g ICRC, MSF)

The largest Ebola epidemic ever recorded. 425 cases isolated and treated, 224 deaths (including 12 nurses and 1 physician); > 6000 contacts traced and followed up, 12 weeks of field work.
Global Partnership: GOARN, Ebola outbreak, Gulu, Uganda, 2000-2001

Person-days

Total
Laboratory
Case Mgmt.
Epidemiology
Coordination/Logistics

CDC
MSF
WHO
ISS-Italy
Canada
UK
Japan
Others

0
200
400
600
800

WHO EPIDEMIC ALERT AND RESPONSE
Responding to the unexpected

“Mystery” disease in Madagascar, August 2002
Global Outbreak Alert and Response (GOARN)

Rapid investigation team of national and international experts with WHO coordination and backup:

- Europe, North America, (e.g. CDC, INVS, Institut Pasteur, NIBSC)
- Support from IFPMA

27,519 cases, 838 deaths. Investigation identified influenza A virus subtype H3N2 as the cause of the epidemic. Epidemic contained. Virological and epidemiological follow up still ongoing.
March 2003: a new severe acute atypical pneumonia emerges in Hanoi, Hong-Kong, and Toronto.

Rapid investigation team of national and international experts with WHO coordination and backup.

- Europe, North America, (e.g. CDC, INVS, HPA, etc.): 27 GOARN partner institutions involved, 117 short term consultants in the field

WHO and SARS
Co-ordination of international response

1) Virtual network for SARS aetiology
- 13 laboratories in 9 countries, daily telephone conference
- identification of SARS coronavirus
- face-to-face/video meeting, 16 April 2003

2) Virtual network of SARS clinicians
- 50+ clinicians in 14 countries, telephone conference twice a week
- case definition
- infection control guidelines
- face-to-face meeting, 14 June 2003
WHO and SARS
Co-ordination of international response

3) Virtual network of SARS epidemiologists
- 32 epidemiologists, 11 institutions, daily telephone conference
- provision of data and specific studies
- face-to-face/audio/video meeting, 16-17 May 2003

4) Global Outbreak Alert & Response Network
- 115 experts from 27 institutions in 17 countries
- field teams sent to 5 countries

5) Modelling group
- 10 institutions, secure web site
WHO and SARS
Co-ordination of international response

6) Zoonotic group
- links with OIE and FAO

7) Communication group
- 14 press releases, 13 press conferences, numerous interviews
- up to 3 500 press stories per day
- 62 Web situation reports
- up to 10 million hits per day

8) Global WHO Senior Management Group
- telephone conference twice a week (HQ, ROs, WROs)
- 18 travel recommendations
WHO and SARS
Guidelines available on WHO Web site (1)

- WHO biosafety guidelines for handling of SARS specimens - 25 April 2003
- Hospital Infection Control Guidance for SARS - 24 April 2003
- Information to Member States regarding goods and animals arriving from SARS-affected areas – 11 April 2003
- Management of SARS - 11 April 2003
- Weekly Epidemiological Record, 4 April 2003
  - WHO recommended measures for persons undertaking international travel from areas affected by SARS;
  - Global surveillance for SARS;
  - SARS: case reporting form
- WHO hospital discharge and follow-up policy for patients who have been diagnosed with SARS – 28 March 2003
- Preliminary clinical description of SARS - 21 March 2003
- Severe Acute Respiratory Syndrome (SARS) - 21 March 2003
WHO and SARS
Guidelines available on WHO Web site (2)

- Guidance for mass gatherings: hosting persons arriving from an area with recent local transmission of SARS - 15 May 2003
- WHO Recommendations on SARS and Blood Safety - 15 May 2003
- First data on stability and resistance of SARS coronavirus compiled by members of WHO laboratory network - 4 May 2003
- Epidemic curves: SARS - 2 May 2003
- Case definitions for Surveillance of SARS - 1 May 2003
- Sampling for SARS diagnostic tests - 29 April 2003
- SARS: Laboratory diagnostic tests - 29 April 2003
- Recommendations for laboratories testing for SARS using polymerase chain reaction (PCR) for detection of SARS-CoV virus - 29 April 2003
WHO and SARS
Improving preparedness

Efficient Early Warning Systems

Oriented towards decision making
Using appropriate simple technology (e.g. modern IT in many settings)

Meeting the challenges of IHR
Improving preparedness

Integrated Disease Surveillance

At all levels of disease notification
Beyond communicable diseases
Optimizing resource allocation
Not compromising programme objectives
Improving preparedness
National Referral Laboratories

An Essential Component for International Health Security

- National resource for diagnostic expertise
  - Accurate and timely characterization of disease agents
- National resource for biosafety
  - Facilities
  - Practices
  - Transport
  - Regulations
Improving preparedness
Two-year Programme for Laboratory Specialists

<table>
<thead>
<tr>
<th>Training Group 1</th>
<th>Training Group 2</th>
<th>Training Group 3</th>
<th>Training Group 4</th>
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<tbody>
<tr>
<td>Cape Verde</td>
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<td>Iran</td>
<td>Bulgaria</td>
<td>Senegal</td>
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<td>Democratic Republic of Congo</td>
<td>Iraq</td>
<td>Turkey</td>
<td>Djibouti</td>
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GLOBAL HEALTH SECURITY
WHO EPIDEMIC ALERT AND RESPONSE
Improving preparedness
Regional Twinning Programmes

Between people and institutions

- Long-term commitment based on personal and professional relationship
- Programme contents **jointly** established for the fulfillment of essential laboratory functions through:
  - Exchange of information, knowledge and skills. Communication +++
  - Technology transfer and training
  - Development of collaborative programmes
  - Follow-up and evaluation process
  - Geographic and/or thematic networking
Improving preparedness
External Quality Control

46 national labs
3 programs
  • plague
  • enterics
  • bacterial meningitis
3 languages
3 shipments/year
WHO Biosafety & Biosecurity Programme

Focus on capacity, prevention and preparedness
Improving preparedness
Biosafety Programme

**Goal**: reduce to the extent possible, the spread of disease caused by accidents or inappropriate handling or usage of pathogenic microorganisms.

National laboratories may handle highly infectious and/or clinically severe agents:

- haemorrhagic fevers (e.g. Ebola, Marburg, Lassa, Nipah, CCHF)
- arboviruses (e.g. WN, YF, RVF)
- severe respiratory viruses (e.g. SARS, influenza)
- others: bacteria (e.g. plague, tularaemia) or eradicated agents (smallpox, poliovirus?)

Improving preparedness
Biosafety Programme

WHO biosafety activities
- Biosafety Advisory Group (BAG)
- Coordination of WHO regional biosafety focal points
- Representation of WHO Biosafety to international agencies, organizations, meetings

Technical assistance
- WHO Biosafety collaborating centres (5)
  - USA (2), Canada, Sweden, Australia
- Special global issues
  - SARS biosafety guidelines and SARS facilities review
  - WHO Smallpox repository inspections
  - Post-eradication issues of poliovirus containment
  - BSL4 laboratory global network
Improving preparedness
Preparedness for Deliberate Epidemics (PDE)

Strengthening national preparedness
- Publications/Guidelines
- Support to national public health preparedness efforts (e.g. Thailand, Jordan)
- Informal networks of BCW Experts
- Disease-specific networks of laboratory experts
- WHO Inter-cluster WG
- Informal contacts with international agencies (FAO, OIE, OPCW, UN) and NGOs (Harvard-Sussex Program, Pugwash)

Support from Government of Australia, Italy, France, The Netherlands and Switzerland as well as some Foundations (NTI, Sloan).
Disease specific networks
Selected BW agents (from 2nd edition WHO publication)

- **BACTERIA**
  - Anthrax (*Bacillus anthracis*)
  - Brucellosis (*Brucella abortus, B. suis and B. melitensis*)
  - Glanders (*Burkholderia mallei*)
  - Melioidosis (*Burkholderia pseudomallei*)
  - Tularaemia (*Francisella tularensis*)
  - Plague (*Yersinia pestis*)
  - Q Fever (*Coxiella burnetii*)
  - Typhus Fever (*Rickettsia prowazeki*)

- **FUNGI**
  - Coccidioidomycosis (*Coccidioides immitis*)

- **VIRUSES**
  - Venezuelan equine encephalomyelitis
  - Smallpox (*Variola virus*)
Improving preparedness
Preparedness for Deliberate Epidemics

http://www.who.int/csr/delibepidemics/en/
deliberate@who.int to answer questions on WHO's activities on BCW
Improving preparedness
Preparedness for Deliberate Epidemics

Why deliberately caused epidemics are different?

Because they fundamentally transform the context in which the public health response must be delivered:

- Need for national and international standard operating procedures between the different actors

The PDE programme is to facilitate preparations of WHO and its Member States for such contingencies
Public Health and Security Overlap
Both different, both needed

Different roles and responsibilities, different mandate, SOP needed

WHO differs fundamentally from the IAEA and the OPCW as it is not in any way empowered to monitor or to verify compliance with international disarmament or non-proliferation agreements.
Public Health and Security Overlap

WHO involvement, some milestones

- 1970, WHO publication: Public Health Aspects of CBW

- 2001, WHA54/14 Resolution on Global Health Security: Epidemic alert & response. Anthrax in the USA: WHO global monitoring and technical support to countries. WHO PDE Team established, WHO inter-cluster WG.

- 2002, WHA55/16 Resolution on Global Public Health Response to natural occurrence, accidental release, or deliberate use of biological and chemical agents or radionuclear material that affect health.


- 2002-04, G7 + Mexico GHS Action Group. WHO involved as an observer, WHO participation to "Global Mercury" exercise.
WHO and the Military

A relationship strictly focused on public health
Public Health and Military Health Services

- Long history in infectious disease control
- Superior infrastructure (some are WHO CC)
- Standardised, systematic surveillance and control of selected infectious diseases (e.g. malaria, HIV, ARI, FUO)
- Sentinel populations with reliable data
  - Numerator/denominator, access to health care, defined case definition, defined demographics, long periods of observation
Potential Public Health Resources

WHO Survey of Military Health Programs

- Three surveys, 1995-2000, 76 countries responded
  - 70% with central co-ordinating military lab
  - 82% with military infectious disease reporting system

- Laboratory capability
  - 74% did basic bacteriology, virology, and parasitology
  - 55% had specialised immunology or molecular capabilities

- Disease screening
  - 51% mandatory HIV screening, 74% malaria screening

- Nearly all countries report diagnoses up chain

- Vaccination policies
  - 90% had compulsory vaccination program
  - 87% tetanus, 31% BCG, 23% meningitis, 19% MMR
ICMM
WHO interface with military health services

- International Committee of Military Medicine
  - Oldest established military health network
  - 110 Member States
  - Official relations with the WHO since 1952
  - Military support to epidemic alert and response operations

ICMM General Assembly, South Africa, 2002
WHO Civil Military Co-operation

- Congo-Crimean Hemorrhagic Fever, Kosovo, June 2001
- Tularemia, Kosovo, Spring 2002
- Ebola Hemorrhagic Fever, Gabon and Congo, Winter 2002
- Diphtheria, Malaria, Leishmaniasis, CCHF, Afghanistan, 2001-2002
- Suspected SARS, Kuwait/Bahrain, Mar/Apr 2003
International Health Regulations - Revision -

International Health Regulations

- Contain known risks
- Respond to the unexpected
- Improve preparedness

Global Partnership

WHO Epidemic Alert and Response
International Health Regulations and Associated Guidelines

“…ensure the maximum security against the international spread of disease with minimal interference in world traffic.”
# International Health Regulations

**A Global Framework for Global Health Security**

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>1374</td>
<td>Venice</td>
<td>Quarantine for Plague</td>
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<tr>
<td>1851</td>
<td>Paris</td>
<td>1st International Sanitary Conference</td>
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<tr>
<td>1947</td>
<td>Geneva</td>
<td>WHO Epidemiological Information Service</td>
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<tr>
<td>1951</td>
<td>Geneva</td>
<td>International Sanitary Regulations</td>
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<tr>
<td>1969</td>
<td>Geneva</td>
<td>International Health Regulations (IHR)</td>
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<tr>
<td>Nov 2004</td>
<td>Geneva</td>
<td>Intergovernmental Working Group meeting</td>
</tr>
<tr>
<td>May 2005</td>
<td>Geneva</td>
<td>Revised IHR, World Health Assembly agenda</td>
</tr>
</tbody>
</table>
International Health Regulations
Key Proposed Changes

- Cover all “public health emergencies of international concern”
- Country capacity requirements: EWARS, POE
- Reports from sources other than Member States (media, private sector, NGOs, etc.)
- WHO 24-hour operations through country focal points
- Emergency Committee
- Review Committee
The revision proposals have been presented, discussed and modified through a number of technical fora:

- Country workshops
- Inter-country workshops
- International meetings
- Individual country briefings

All WHO Regions have participated in these activities; A small number of countries provided written comments on the current regulations and the proposals.
International Health Regulations

Key issues raised

- Scope - Disease lists and/or Public health emergencies
- National sovereignty vs. international responsibility
- Incentives and compliance
- Rapid response vs. transparent/inclusive procedures
- Consistency with other international obligations/treaties
- Developed vs. developing nation perspectives
- Specificity vs. flexibility
International Health Regulations
Opportunities and challenges

- **Country capacity strengthening requirement**
  Long term effort (EWARN, QA/QC, biosafety, PDE), performance indicators available, cost estimates under development … but who will support?

- **Global alert and response operations required**
  WHO to invest in global partnership (GOARN), resources needed to cope with operations between crises

- **Harmonization with other global players**
  UN agencies (WTO, UNHCR, FAO, ICAO), IGOs (EU, G7, OIE), NGOs (MSF, IFRC), industry (IATA, IMO, WTA, IFPMA) etc.
SARS and the media

Thank you

http://www.who.int

outbreak@who.int