The International Health Regulations (IHR 2005)
International Alert and Response to Epidemic and Pandemic Threats

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Epidemics and Pandemics have shaped our history...

1st Millenium

Middle Ages

20th Century

Epidemic and Pandemic Alert and Response

World Health Organization
WHO has verified more than 1000 events between January 2001 and March 2005.
Context of emerging/epidemic disease at the beginning of the 21st. century

- Emergence of new or newly recognised pathogens (e.g. H5N1, SARS, Ebola, Marburg)
- Resurgence of well characterised outbreak-prone diseases (e.g. cholera, dengue, measles, meningitis, shigellosis, yellow fever)
- Accidental or deliberate release of a biological agent (e.g. BSE /v CJD, smallpox, SARS, anthrax)
A Changing World!

- Collapse of public health infrastructure
- Poverty, urbanisation and population displacement
- Environmental exploitation and degradation
- Complex and natural disasters

Epidemic and Pandemic Alert and Response
A Changing World!

- Development of antimicrobial resistance
- Animal diseases crossing into human populations
- Globalisation of travel and trade (great benefits but new threats!)
- Inappropriate social, political and economic responses to outbreaks

Epidemic and Pandemic Alert and Response
The Reality – We are Vulnerable!

- Epidemic/pandemic diseases will continue to emerge and re-emerge because of
  - Evolutionary pressures (efficient adaptation of the microbial world)
  - Poor adaptation of the human world!
    - Environmental change
    - Human behaviour
    - Human trade, travel & technology
- They will stress health systems, society, economies and even political systems as they
  - Are unexpected
  - Are poorly understood and cause high mortality
  - Can spread quickly and have no immediately available cures
The Challenge

Ensuring that the global community can rapidly share information, mobilise resources and implement rational control measures in the face of a major public health emergency

Getting immediate access to global expertise and utilising and focusing that knowledge to support countries facing disease threats

Turning knowledge gained into effective interventions in time to make a difference!

No single institution has all the capacity!

WHO brings partners together to focus and coordinate global resources

Epidemic and Pandemic Alert and Response
Current Avian Influenza Situation

- The H5N1 virus is now present in birds in 45 countries.
- Since 1 Feb 2006, H5N1 virus was detected for first time in 31 countries
- The virus has crossed the species barrier on multiple occasions to infect 225 people in 910 countries (inc. 128 deaths)
- The virus causes severe disseminated disease affecting multiple organs and systems with fatal infection in more than half those affected
- Most cases have occurred in previously healthy children and young adults
- As no virus of the H5 sub-type has ever circulated widely in humans, vulnerability to infection with a pandemic H5 strain will be universal
Confirmed Human and Animal H5N1 Infections since 2003 and Poultry Distribution
Confirmed Human H5N1 Cases
Distribution of Age Groups
All Countries

Epidemic and Pandemic Alert and Response
Conditions for a Pandemic

3 Triggers

- A novel virus emerges in animals
- The virus demonstrates that it can pass from animals to humans and cause disease
- The virus develops capacity to transmit efficiently from human to human
Why We Are Concerned

Ingredients for a pandemic are abundantly available

Avian influenza virus + Human influenza virus = Pandemic influenza virus

Or: ADAPTATION (e.g., 1918?)

Epidemic and Pandemic Alert and Response
Risk Assessment

- The risk of a pandemic is great
- The risk will persist
- The evolution of the threat cannot be predicted
- A pandemic will cause significant disease, death and will stress health, social and economic systems
- We have a window of opportunity to prepare!
- We have a chance to fundamentally strengthen national and international public health systems to deal with epidemics!
Recorded Influenza Pandemics

1: epidemic, 2: probable pandemic, 3: pandemic
## Pandemic Phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Pandemic Alert</th>
<th>Pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpandemic phase</td>
<td>Low risk for humans</td>
<td>No or only inefficient h2h transmission</td>
<td></td>
</tr>
<tr>
<td>&quot;Animal influenza outbreaks&quot;</td>
<td>High risk for humans</td>
<td>Evidence for increased h2h transmission</td>
<td></td>
</tr>
<tr>
<td>Pandemic Alert</td>
<td>&quot;New influenza subtype in humans&quot;</td>
<td>Significant increase in h2h transmission</td>
<td></td>
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<tr>
<td>Pandemic</td>
<td></td>
<td></td>
<td>6</td>
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</tbody>
</table>

*Epidemic and Pandemic Alert and Response*
Epidemic/Pandemic Control Requirements

1. Strong national public health systems and capacity
2. Specific preparedness for key priority disease threats (e.g. diagnostics, therapies, vaccines, containment measures)
3. An effective international system and partnership for coordinated alert and response
The World Health Organization (WHO)
A Unique Global Health Network

- 194 Member States
- 1 HQ in Geneva + 6 Regional Offices
  - AFRO, Brazzaville / Harare
  - AMRO/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

Epidemic and Pandemic Alert and Response
WHO is Supporting Countries Utilising its...

- **International Mandate**
  - Close collaboration with WHO member states under the framework of the revised International Health Regulations.

- **Decentralised Structure & Capacity**
  - Ability to act as a regional and global co-ordinating force with 6 Regional Office hubs and 142 country offices.

- **Experience**
  - Building national public health capacity and co-ordinating urgent international action and communication (e.g. SARS).

- **Partnerships**
  - Networking with and mobilization of the best technical institutions including the Global Influenza Network, the Global Outbreak Alert and Response Network (GOARN) and key regional networks.
Epidemic Alert and Response

Protect the world ...

The revised International Health Regulations (IHR(2005))

World Health Organization
The International Health Regulations are:

- One of two legally-binding global agreements to protect public health
- Adopted at the World Health Assembly (WHA) & binding on WHO’s Member States
- IHR revised at member state's request & adopted in 2005.
- Full entry into force in June 2007
Legal Basis for the IHR - the WHA

Article 21 of the WHO Constitution:

The Health Assembly shall have the authority to adopt regulations concerning:

(a) sanitary and quarantine requirements and other procedures designed to prevent the international spread of disease;
Technical consultations

The revision proposals were presented, discussed and modified through a number of technical fora including:

- Country workshops
- Inter-country workshops
- International meetings
- Individual country briefings
The Intergovernmental Working Group (IGWG)

- Two sessions: November 2004 & February to May 2005
- Palais des Nations & WHO HQ, Geneva
- Objective: to review and amend the proposed draft and endorse a final text of the revision to be presented to WHA for adoption
- Over 500 participants in 155 national delegations registered
- Bureau of Regional representatives established, WG chaired by Ambassador Whelan, from the Irish Permanent Mission to Geneva
Why have IHR?

- Serious and unusual disease events are inevitable
- Globalisation - problem in one location is everybody’s problem
- An agreed code of conduct to:

  "prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade" (Art. 2)
Implementing the IHR

**National actions**

- Alert and response systems for internal events
- Protective measures against external risks and events

**International actions**

- Support to national alert and response systems
  - Support to developing the national systems
  - Emergency operations (e.g. GOARN)
- Guiding and coordinating
  - Information and recommendations

Epidemic and Pandemic Alert and Response
Importance of national capacity

The best way to prevent international spread of diseases is to detect public health threats early and implement effective response actions when the problem is small

- Early detection of unusual disease events by effective national surveillance
- Systems to ensure response (investigation, control measures) at all levels (local, regional, and national)
Some principle approaches

<table>
<thead>
<tr>
<th>Continuous risks</th>
<th>Sudden increase in risk</th>
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<tbody>
<tr>
<td>• Routine measures</td>
<td>• Detection</td>
</tr>
<tr>
<td>• &quot;sanitary&quot; points of entry and conveyances</td>
<td>• information &amp; verification</td>
</tr>
<tr>
<td>• travellers, goods etc.</td>
<td>• notification</td>
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<tr>
<td>• Specific measures for certain known risks</td>
<td>• risk assessment</td>
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<tr>
<td>• Vector control, vaccination</td>
<td></td>
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<tr>
<td>• Standing recommendations</td>
<td>• Response</td>
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<td></td>
<td>• Support to investigation and control</td>
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<td>• Information and recommendations</td>
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Epidemic and Pandemic Alert and Response
IHR(2005)

Part I – Definitions, Purpose And Scope, Principles And Responsible Authorities

Part II – Information And Public Health Response

Part III – Recommendations

Part IV – Points Of Entry, Part V – Public Health Measures

Part VI – Health Documents, Part VII – Charges

Part VIII – General Provisions


Epidemic and Pandemic Alert and Response
Broader scope – notification, response
(Art.s 1, 6, Annexes 1 & 2)

- Definitions of disease, PHEIC, public health risk
- Biological, chemical and radiological aetiology remains implicit
Notification

- Start of a dialogue to determine actions needed
- No automatic publication or response
- Decision instrument (Annex 2) to identify events to be notified
Notification decision instrument

Annex 2 – to decide on need for notification any public health event can be assessed by the criteria

- Is the public health impact of the event serious?
- Is the event unusual or unexpected?
- Is there a significant risk of international spread?
- Is there a significant risk of international travel or trade restrictions?

In addition 4 disease events must be notified

Diseases (some may be regionally defined) trigger assessment
Obligation to establish core capacities
(Art.s 5, 13, 19 & Annex 1)

- Surveillance and response
- Points of entry
- What happens in countries is most important - key element of WHO strategy for Global health security
National IHR Focal Points
(Art.s 4, 6, 27 & Annex 1)

- National office of IHR coordination
- Efficient communications in emergencies
- Not bypassing existing mechanisms
- WHO Office, INFOSAN, Chemical alert,
- National coordination

A practical step towards IHR compliance
IHR National Focal Points

Providing to WHO:
Notification, continuing information
Verification
Consultation
Reporting

Receiving from WHO
Information
Requests
Recommendations

National
Disseminating information, recommendations and requests from WHO
Receiving information from national sectors
Interacting with senior health and other government officials
System assessment and planning
Link to National emergency planning infrastructure
IHR(2005)

Recommended measures
(Art.s 15 – 17, 48, 49 & 53)

- Context specific
- Flexible
Procedural guarantees for States
(Art.s 12, 47 – 55)

- Roster of experts
- Emergency committee
- Review committee
- World Health Assembly role
Implementation of IHR(2005) – next steps for States and WHO

Political and technical awareness and commitment

National Focal Points

• designation, functional network, communications

Analysis of the text

• reservations, national legislation

Capacity assessment & Plans of action

• surveillance and response, points of entry

Administrative procedures

• Establishing roster of experts, committees, information, reservations, reports
Resolution WHA59.2: Early voluntary compliance with IHR (2005) provisions relevant to Avian Influenza & Pandemic Influenza

- URGES Member States to take a variety of actions, including:
  - Designation of National Focal Points
  - Notification of human cases of avian influenza
  - Dissemination to WHO Collaborating Centres of information and biological materials relating to highly pathogenic avian influenza...

- REQUESTS the Director-General to take key actions, including:
  - Designation of WHO IHR Contact Points
  - Implementation of IHR (2005) measures relevant to resolution, such as surveillance, verification and public health response
IHR(2005)

IHR document:
http://www.who.int/csr/ihr/WHA58_3-en.pdf

More information, FAQs on IHR:
http://www.who.int/csr/ihr/en/

Travel Health:
http://www.who.int/ith/en/
Key Strategic Actions for Human Pandemic Influenza

1. Reduce human exposure to H5N1
2. Strengthen the early warning system
3. Intensify rapid containment operations
4. Build capacity to cope with a pandemic
5. Co-ordinate global science & research including acceleration of vaccine development & expansion of production capacity

Education
- National/Regional/Global
  - In response to human cases/clusters
    - Rapid field investigation

Compensation
- National/regional/global preparedness requires
  - Commitment
  - Improve the ability of the world to develop, produce and deliver vaccine to large numbers of people in a timely manner
  - Strengthen WHO's capacity to gather real-time scientific data, access global expertise and translate into vital advice and guidance

Communication
- National/Regional/Global
  - Real-time risk assessment
  - Immediate communications
  - In response to human cases/clusters
    - Rapid field investigation
  - Contact tracing and monitoring
  - Stringent infection control
  - Intervention with international stockpile following the first signs that the virus is transmitting from human to human

National/regional/global preparedness requires
- Communication with the public
- Command & Control systems
- Capital investment

Epidemic and Pandemic Alert and Response
WHO Global Surveillance System for Human Influenza

Annual output
- ~ 175,000-220,000k samples;
- 15,000-40,000 isolates;
- 2,000-10,000 viruses characterized

- 112 specialised laboratories in 83 countries
- 4 international reference centres

Epidemic and Pandemic Alert and Response
National Pandemic Preparedness

- Building on a Regionally implemented strategy for strengthening national early warning and response systems
- Rapid increase in number of countries with plans or with plans in preparation
- From < 50 countries 9 months ago to approx 140/194 today (70%)
- We can’t stop here...!
  - Operationalisation and implementation
  - Exercises/Rehearsals
  - International co-ordination of plans (e.g. borders, stockpiles)
Global Scientific Co-ordination, Knowledge Management

- Global co-ordination of scientific collaboration
  - Public health measures
  - Vaccine development
  - Epidemiology/Investigation...
  - Diagnosis and virus monitoring
  - Clinical Management & Infection Control
  - Early Containment
  - Social mobilisation

- > 50 publications and guidelines since April 2004 on H5N1 with 11 further documents in pipeline
Elimination of a pandemic virus at its source?

Virus emerges

- Onset to admission: 4-5 days
- Sampling to diagnosis: 2-4 days
- Field investigation: 5-7 days
- Virus characterization: 3-4 days
- Intervention: 10-14 days

Too late...

Epidemic and Pandemic Alert and Response
WHO Early Containment Protocol

- Objective: extinguish pandemic at its source; eliminate pandemic virus before further spread from the emergence site
  - (initial) moderate transmissibility and
  - If detected early we have localised spread and rapid intervention

- Non-pharmaceutical interventions (social distancing/quarantine)

- Pharmaceutical Interventions (3 million treatment courses)

- Major logistics challenge + Rapid deployment in the field (pre trained teams etc.)

- Protocol drafted and published
Influenza Vaccine

- Global production capacity of 300 million doses per year
- Mainly in developed countries
- >95% of production capacity in 5 countries
- Options
  - Make the existing vaccine capacity go further
  - Scale up production (how?)

Epidemic and Pandemic Alert and Response
WHO Operational Support for a Pandemic...

- Real-time global coordination using the Strategic Health Operations Centre
- Sensitive global disease intelligence gathering and verification
- Collaborative risk assessment, effective information management and rapid risk communication
- Ongoing tracking of disease spread
- Rapid provision of technical support and deployment of field response teams from GOARN and regional network mechanisms.
- Immediate advice on control measures as epidemiological potential of the virus evolves
- Development of new interventions
2006: Field Operations in 26 Countries

- Rapid deployment of field teams for risk assessment, outbreak response and field investigations and country preparedness missions in 24 countries.
- Development and deployment of AI field investigations tools
- Training of international and MoH teams in personal protective equipment (PPE), sample transport protocols and equipment, and other outbreak response equipment
- Training in infection control and case management
- Procurement and deployment of PPE, tools, sample transportation materials and anti-viral medications to support field teams
WHO Alert and Response Operations

- Systematic gathering of epidemic intelligence
- Rapid verification procedures
- Real time collaborative risk assessment and communications
- Coordination of international assistance through international teams, stockpile release, virtual networking etc
GOARN is a global technical partnership of coordinated by WHO

... provides rapid international multi-disciplinary technical support for outbreak response

GOARN in the field (2000-2005)

- > 180 technical partners (inc regional and sub-regional networks
- More than 70 Countries
- More than 70 international outbreak responses
- 80 GOARN partner institutions mobilized
- More than 500 experts deployed
Lessons Learned in the Trenches Of Epidemic Response!

- WHO is most effective when it works through partnership and in a co-ordinated fashion with
  - member states and other international Organizations
  - technical partners in the public, academic and private sector

- Effective working relationships have been forged when collaboratively dealing with major disease threats e.g.
  - SARS, Plague, Avian Influenza

- These relationships have been based on mutual need, collective responsibility, transparency, personal commitment, and pride in our organizations and systems

- This is not reproducible or sustainable in the context of pandemic influenza without a major investment in national, regional and global public health

Epidemic and Pandemic Alert and Response
Key Strategic Actions for Pandemic Influenza

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Building public health capacity to deal with influenza will lead to stronger national systems for alert and response linked to a comprehensive global alert and response system that will serve to protect us from whatever nature has in store for us in the future!
THANK YOU