

Contents

- Evolution of public health security
- Threats to public health security
- New health threats in the 21st century
- Learning lessons, thinking ahead
- Towards a safer future



Why this report – and why now

- Today more than ever the international spread of disease or other risks threatens health, economies, and security.
- No country can "go it alone" in protecting its citizens from the threats.
- New, revised International Health Regulations provide a comprehensive legal framework for global public health security.



Global public health security – a definition

"Global public health security minimizes vulnerability to acute public health events that endanger the collective health of populations living across geographical regions and international boundaries, and includes the impact on economic, political stability, trade, tourism, access to goods and services and demographic stability."



Evolution of public health security

Outbreaks of infectious diseases and health emergencies have threatened public health security throughout history.

- **Plague:** In 1348, plague killed up to two-thirds of the population in Europe.
- **Cholera:** In 1855, cholera killed an estimated 500 people in a 10-day period in London.
- **Smallpox:** Smallpox ravaged populations until it was finally eradicated in 1979.



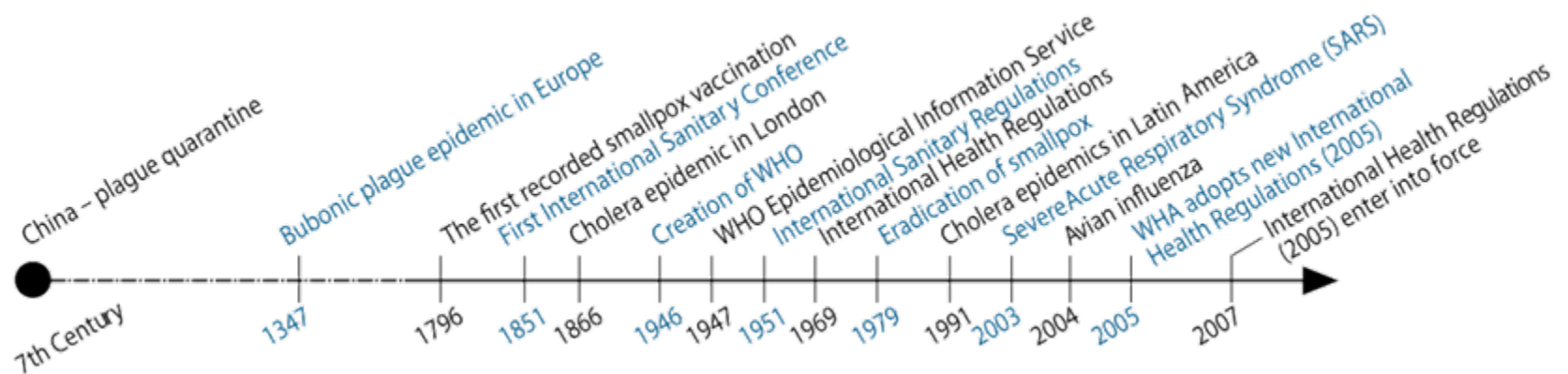


International cooperation – origins

- Traditional control measures – **quarantine**, **sanitation** and **immunization** – became inadequate.
- International cooperation needed to control the spread of infectious diseases.
- International conventions on sanitation and health of the 1850s evolved into the International Health Regulations (1969).
- Revised IHR (2005) came into force in June 2007.



Significant events in public health





The Global Outbreak Alert and Response Network (GOARN)

- A global system of epidemic alert and response based on technical partnership and networks.
- Provides international alert on outbreak.
- Provides rapid technical support.
- Help organize stockpiling, vaccines, drugs and equipment distribution.
- Specialized unit enables experts to work in extreme environments.



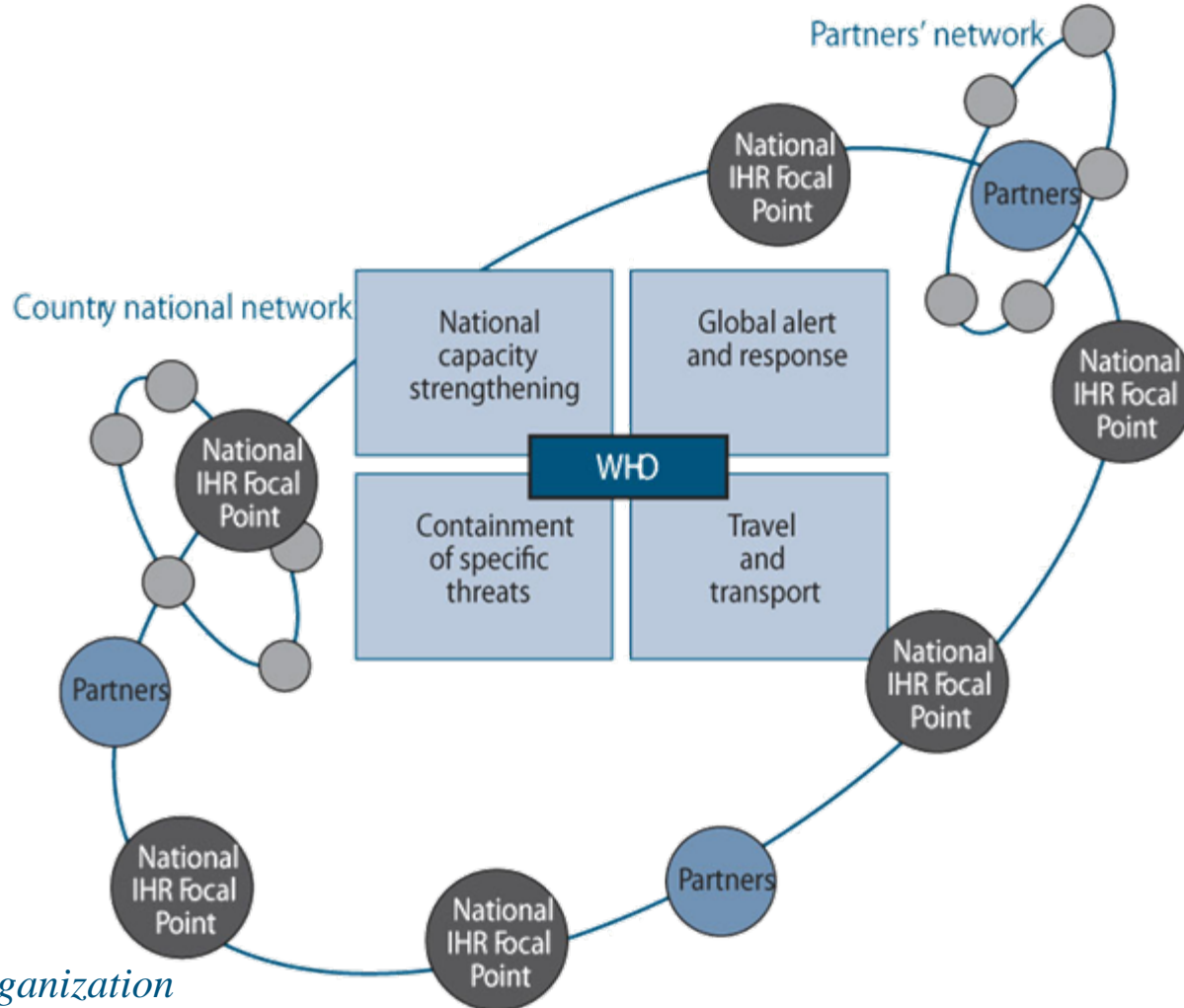
The Chemical Incident Alert and Response System (ChemiNet)

- ChemiNet (similar to GOARN) informs WHO of chemical incidents or outbreaks of illness of potential international importance.
- Extended in 2006 to cover other environmental health emergencies such as water, sanitation, and radiological events.



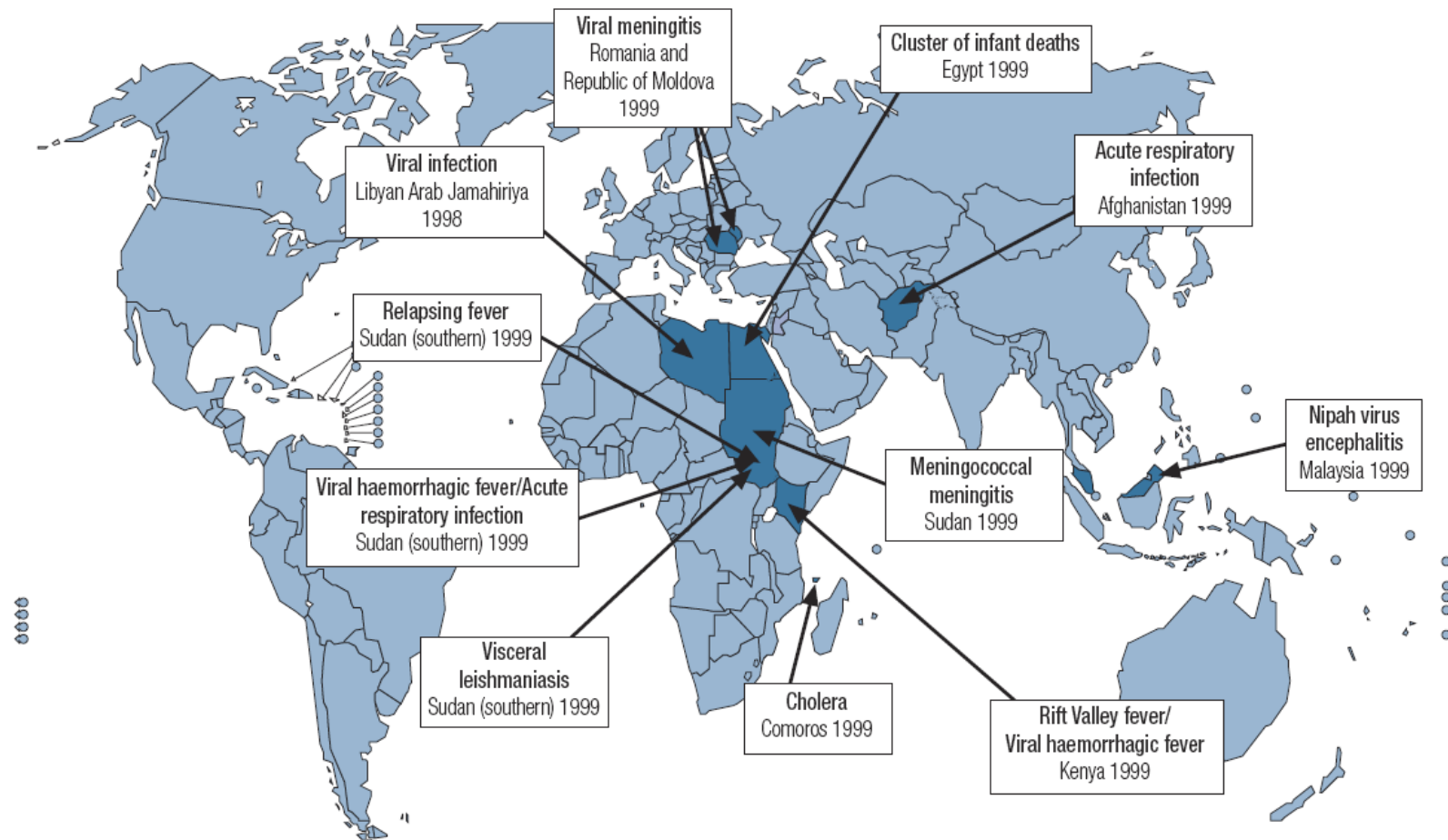
Global network of national health systems and partners, coordinated by WHO

(four major areas of work)





Examples of international epidemic response missions, 1998–1999



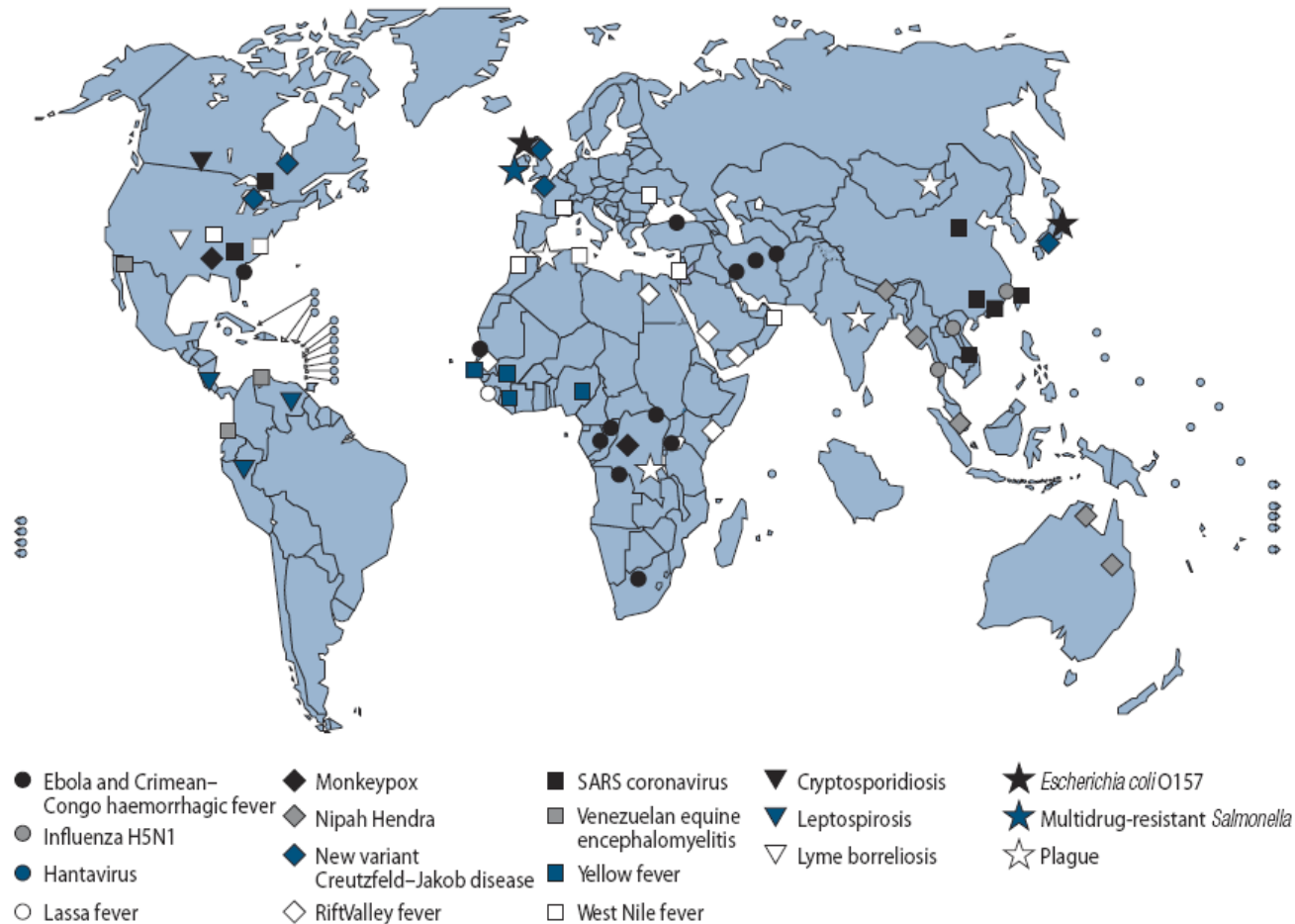


The Global Polio Eradication Initiative Network

- Supports surveillance of many other vaccine-preventable diseases.
- Plans and monitors immunization campaigns.
- Backs disaster relief efforts.
- After polio eradication, investment in this network will broaden its mandate.



Selected emerging and re-emerging infectious diseases: 1996–2004





Threats to public health security

- Decisions and actions taken (by governments or individuals) in investments or surveillance measures.
- Conflict, displacement, lack of commitment, misinformation.
- Microbial evolution and antibiotic resistance.
- Radionuclear or chemical events.



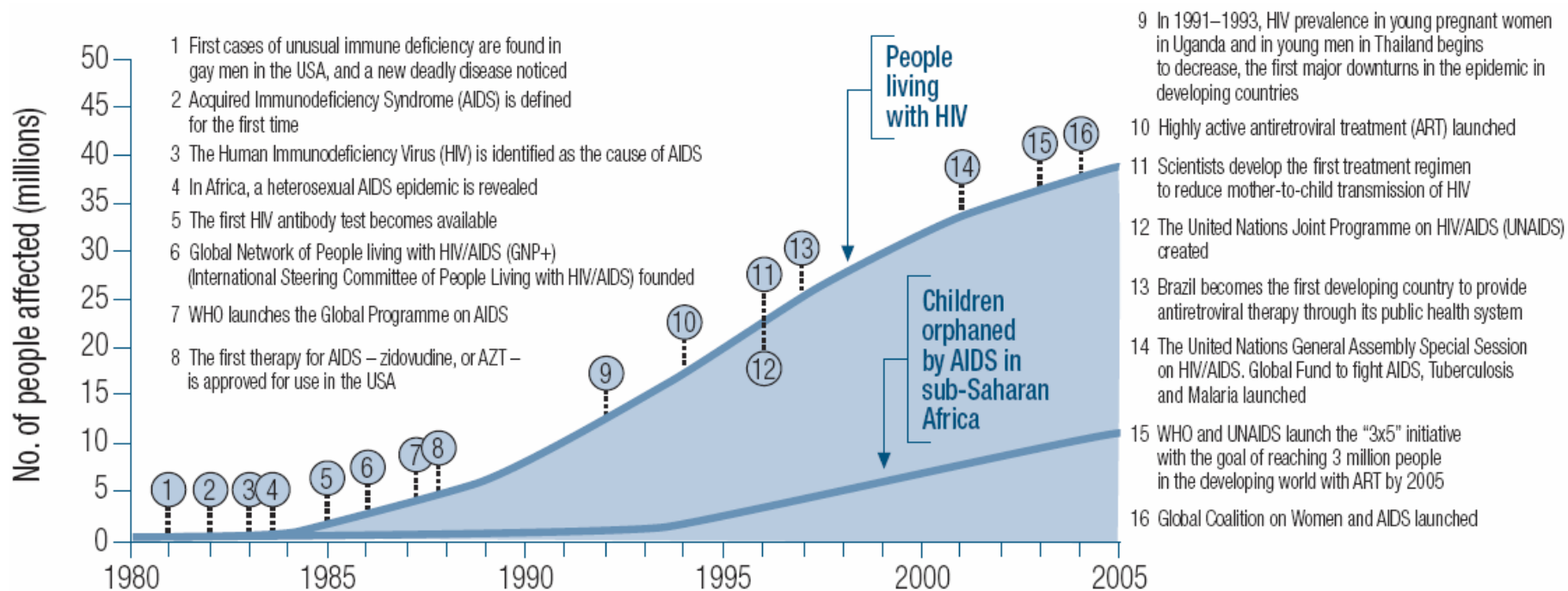


Inadequate investment

- Reduced vigilance of prevention programmes can result in outbreaks.
- Vector-borne diseases re-emerged in sub-Saharan Africa after widespread use of insecticides ended.
- Real global threats of HIV/AIDS was only recognized after first cases in the United States.



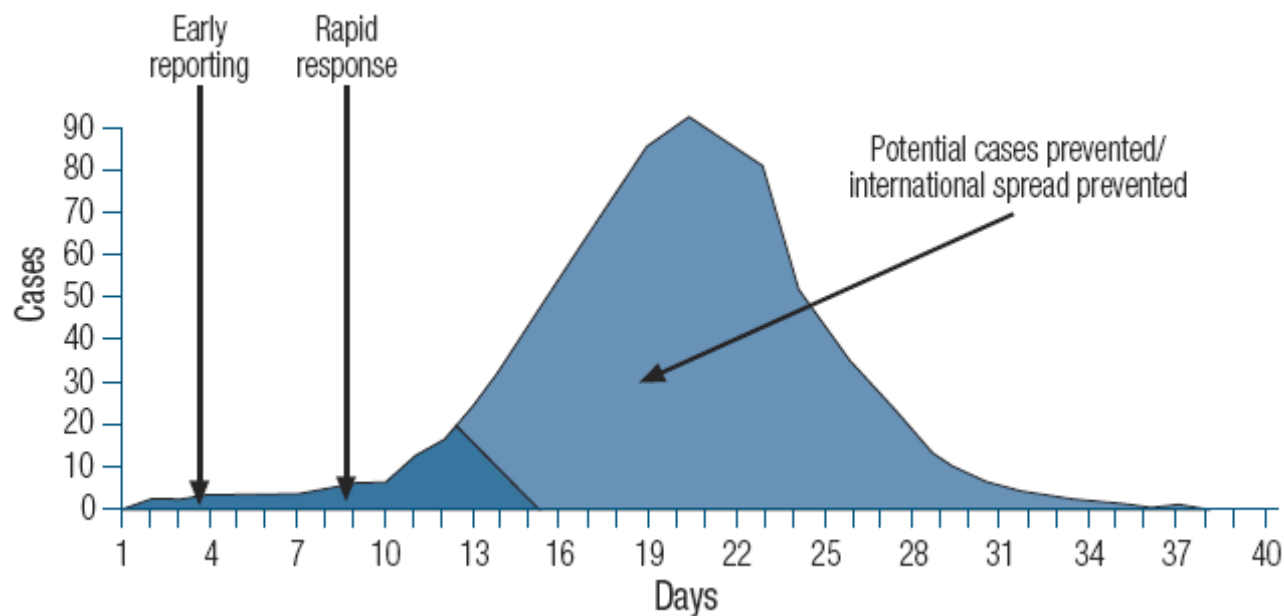
Twenty-five years of HIV/AIDS



Source: 2006 Report on the global AIDS epidemic. Geneva, Joint United Nations Programme on HIV/AIDS, 2006.



Global outbreaks, the challenge: late reporting and response





Unexpected policy changes - repercussions

- Oral polio vaccine was claimed to be unsafe in **Nigeria** in 2003.
- Government reduced immunization.
- A large outbreak of polio resulted; previously polio-free areas were infected.
- Thousands of children paralysed.
- The disease spread to polio-free countries.



Conflict

- **Civil war in Angola** hampered efforts to contain an outbreak of Marburg haemorrhagic fever in 2005. (200 people affected, 90% died).
- **Rwanda crisis** up to 800 000 people fled to the Democratic Republic of the Congo. In the absence of adequate sanitation, about 50 000 died from cholera and dysentery.





Microbial evolution and antibiotic resistance

- Evolution of resistance to anti-infective drugs contributes to the emergence and re-emergence of infectious diseases.
- Bacteria develop resistance to antibiotics through spontaneous mutation and through the exchange of genes between bacterial strains and species.



Other public health emergencies

- Radionuclear and chemical events with the potential to cause harm on a global scale are within the broad scope of the IHR (2005).
- Reactions to such events, regardless of their origin, rely on the same epidemiological principles of surveillance, early detection and response as biological threats to safeguard health.



Surveillance: the cornerstone

Without appropriate, functioning surveillance systems, unusual health events cannot be detected, monitored for their likely impact, or measured for the effectiveness of interventions put in place to counteract them.





New health threats in the 21st century

- Bioterrorism
- Emergence of SARS
- Massive dumping of toxic chemical waste in Côte d'Ivoire





Bioterrorism – anthrax letters

- Anthrax spores in letters in the United States in 2001 affected 22 people, killing five.
- Huge economic, public health and security consequences.
- Renewed concern about bioterrorism.
- Many countries took counter measures.
- WHO was asked to play advisory role.
- A global rehearsal for response to a biological attack.

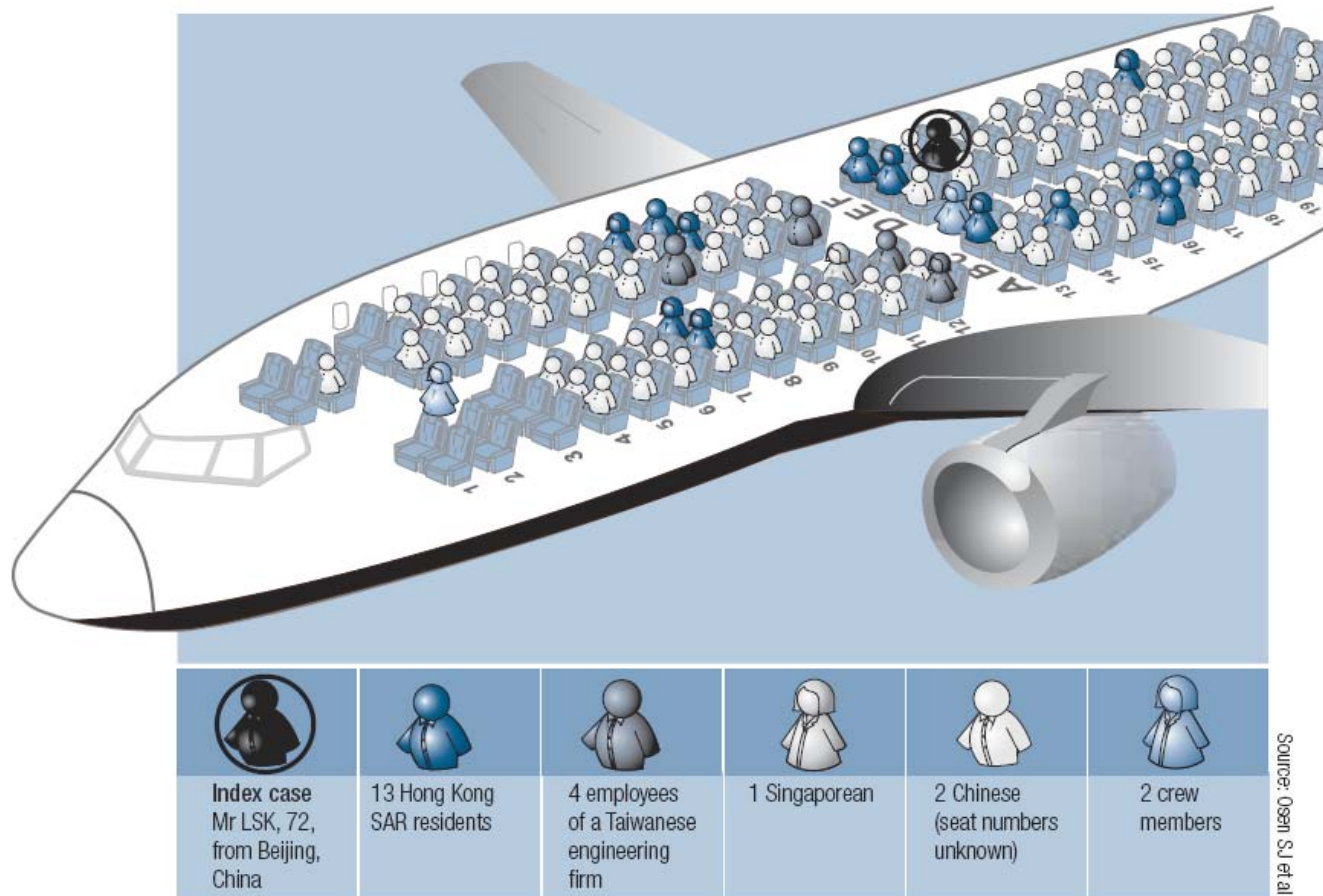


SARS – vulnerability revealed

- Spread from person to person.
- Required no vector.
- Incubated silently for over a week.
- Mimicked symptoms of other diseases.
- Killed about 10% of those infected.
- Spread easily along international air travel routes - 2 billion passengers/year.
- Spread in city hospitals.
- Damaged economies, societies, politics and the international image of countries.



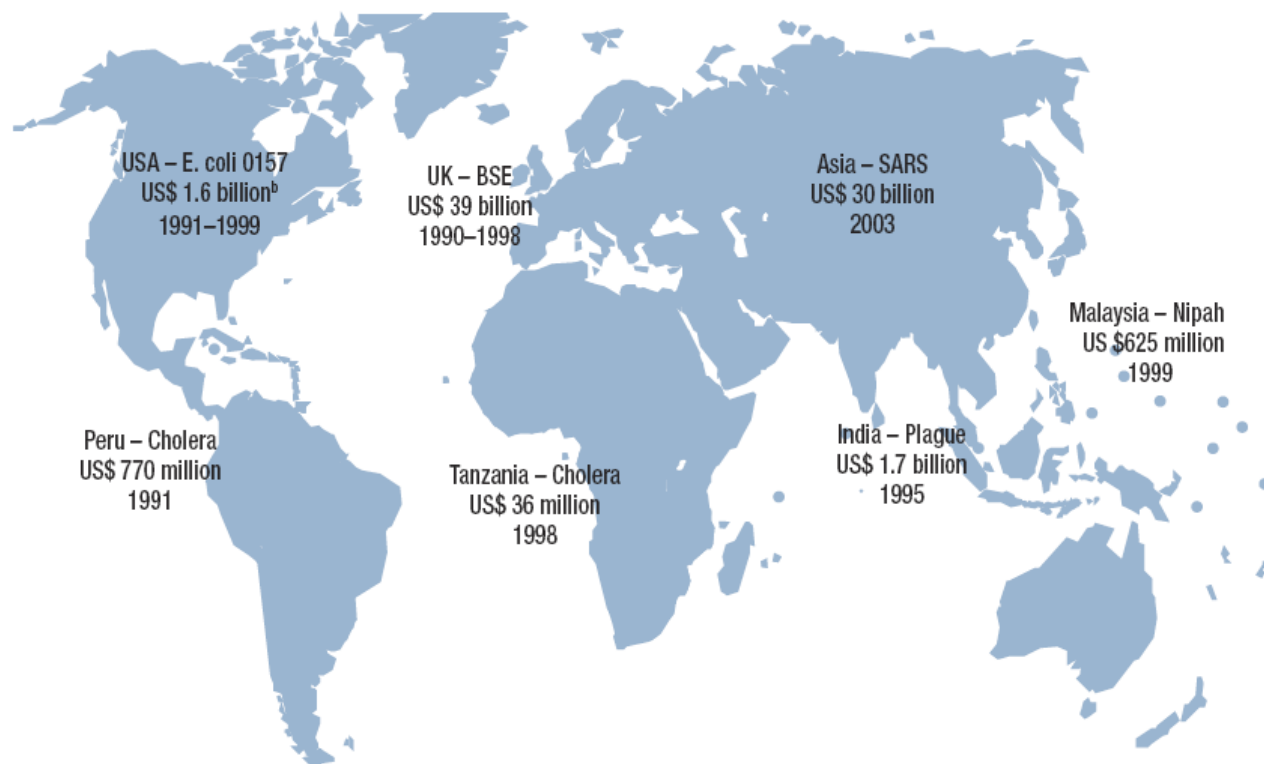
Probable SARS transmission on flight CA112 in March 2003



A total of 22 passengers, and the index case, met WHO's definition of a probable case of SARS.



Direct economic impact of selected infectious disease outbreaks, 1990–2003^a



^a Excludes economic impact of human sickness and death.

^b Date source: (8).



Dumping of toxic chemicals

- In August 2006 over 500 tons of chemical waste unloaded from a cargo ship were illegally dumped at different sites in **Abidjan - Côte d'Ivoire**.
- The waste caused a variety of symptoms in the population (eye, nose, throat irritation, worsening of chronic diseases).





Learning lessons and thinking ahead

- For 50 years, countries have freely shared and exchanged genetic information on the changing strains of circulating influenza viruses.
- Epidemiological trends of influenza infection are gathered by an extensive surveillance network.
- Examples of XDR-TB, polio, natural disasters.





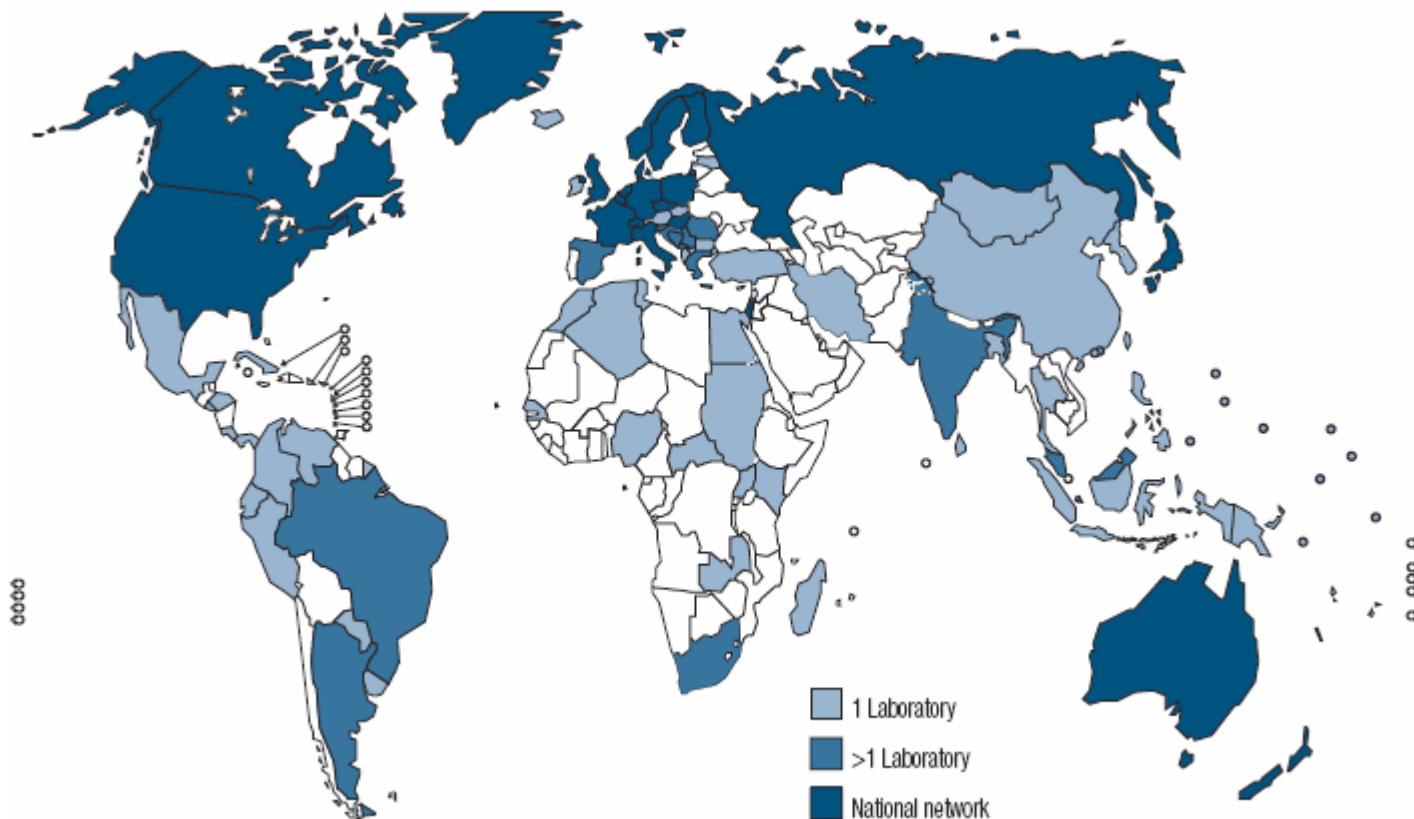
Influenza networks – global early warning systems

Administered by WHO

- **Global Influenza Surveillance Network:** 118 national centres in 89 countries, and four WHO collaborating centres in Australia, Japan, the United Kingdom and the United States.
- **FluNet:** an Internet-based geographical information system allowing real time access to the latest data on circulating strains and epidemiological trends.



WHO influenza surveillance network





H5N1 avian influenza

- H5N1 was isolated in humans in 1997.
- Huge outbreaks in poultry were accompanied by human infections.
- By May 2007, 12 countries had reported 308 human cases including 186 deaths.
- A pandemic could affect 25% of the world's population (1.5 billion people).
- Economic, social costs would be huge.
- A pandemic is a matter of when, not if.



Pandemic influenza – preparedness

- Millions of birds have been destroyed.
- Almost all countries now have avian and human pandemic plans in place.
- WHO tracks and verifies dozens of rumours of human cases.
- Field investigations and response training have been intensified and kits distributed.
- Some countries have antiviral drugs.



WHO's strategic action plan for pandemic influenza

Five key action areas.

- Reducing human exposure to H5N1.
- Strengthening the early warning system.
- Intensifying containment operations.
- Building capacity to cope with a pandemic.
- Coordinating global scientific research and development.





Extensively drug-resistant tuberculous (XDR TB) – causes

- Inadequate health systems result in failures: in management, supervision of health staff and treatment of patients.
- Resistance is aggravated by disruptions of drug supplies.
- Poor clinical management means patients fail to complete treatment.



Managing the risk and consequences of international spread of polio

- The risk that polio might re-emerge after eradication justifies its designation in IHR (2005) as a notifiable disease.
- The alert and reporting mechanisms mandated by IHR (2005) are essential to the polio eradication surveillance network.



Natural disasters

- Affected 134.6 million people and killed 21 342 in 2006.
- Threatened already stretched health systems.
- Caused infectious disease epidemics, acute malnutrition, population displacement, acute mental illness and the exacerbation of chronic disease.



Towards a safer future – IHR (2005)

- An international law to prevent the spread of public health emergencies.
- WHO Member States bound to cooperation and transparency.
- Compliance will reduce outbreaks' impact.





Towards a safer future – IHR (2005)

- All countries must detect, assess, notify and report events covered by IHR.
- Mandatory notification of a single case of some rare disease e.g. smallpox, polio.
- The IHR include emergencies caused by releases of chemical or radionuclear materials.
- WHO can use early unofficial sources of information, but will verify with countries before taking any action.



Strategic actions to guide IHR (2005) implementation

- Ensure all countries are aware of new rules and collaborate.
- Ensure each country assesses, upgrades its resources and develops action plans.
- Strengthen WHO global alert and response systems and management of specific risks.
- Regular progress reports to World Health Assembly.



Recommendations to secure global public health (1)

- Implementation of IHR by all countries.
- International cooperation in surveillance and outbreak alert and response.
- Share knowledge, technologies and materials.



Recommendations to secure global public health (2)

- Global responsibility for capacity building in all countries.
- Governments' cross-sector collaboration.
- Increased resources for training health personnel; advanced surveillance; stronger laboratory capacity; response networks support; progress on prevention.



Postscript

"International public health security is both a collective aspiration and a mutual responsibility. The new watchwords are diplomacy, cooperation, transparency and preparedness."



Dr Margaret Chan
Director-General, WHO