WHO/OMS

Veterinary Public Health Workshop:
Hong Kong SAR, October 4-5th, 2010

Zoonoses in Asia: an international perspective

Peter K. Ben Embarek

Food Safety, Zoonoses and Nutrition

World Health Organization (WHO), Beijing, China

Content

World Health Organization

- The Changing environment and the emergences of new zoonoses
- Current main zoonoses of concerns in Asia
- Managing new and emerging threats at the international level (Infosan and IHR).

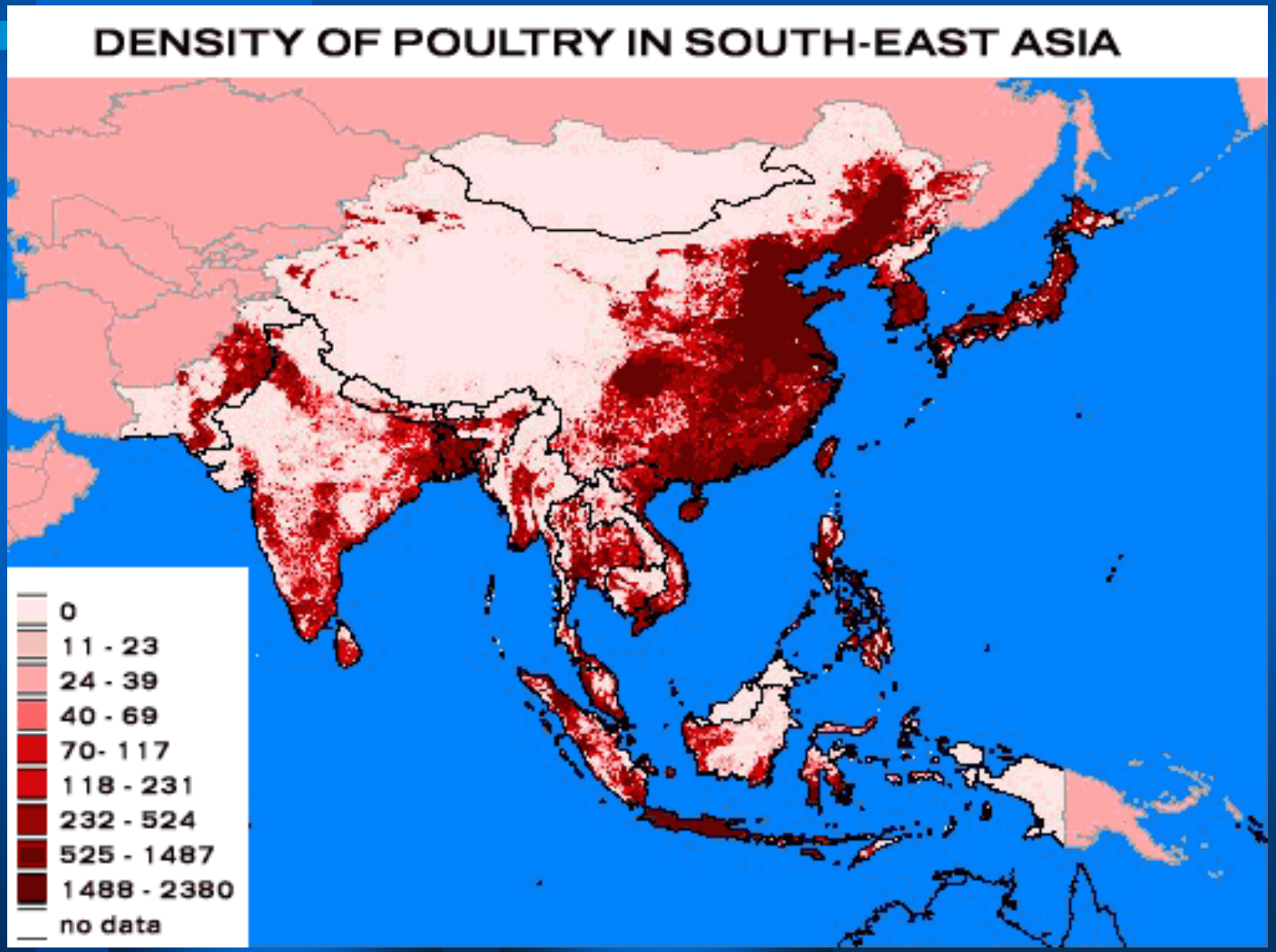
We live in a changing World

- **Humankind continues to change and to change its surroundings**
  - **Urbanisation**
  - **Globalisation of travel and trade**
  - **Environmental degradation**
  - **Expansion of human settlements**
- **Microbes adapt and become resistant.**
- **Changing nature of our interactions alters disease dynamics**

In the last 60 years, 335 new infectious diseases; 30% transmitted through food.

Asia's particularity : High density of poultry

World Health Organization

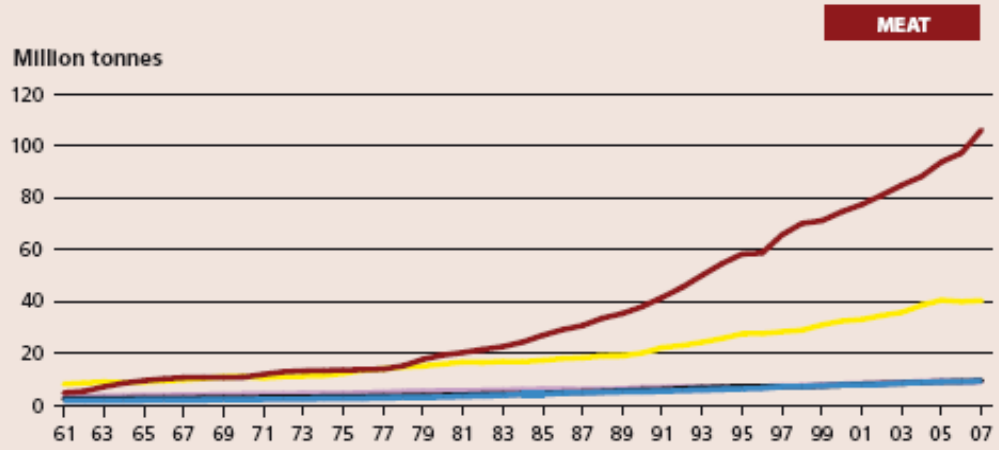


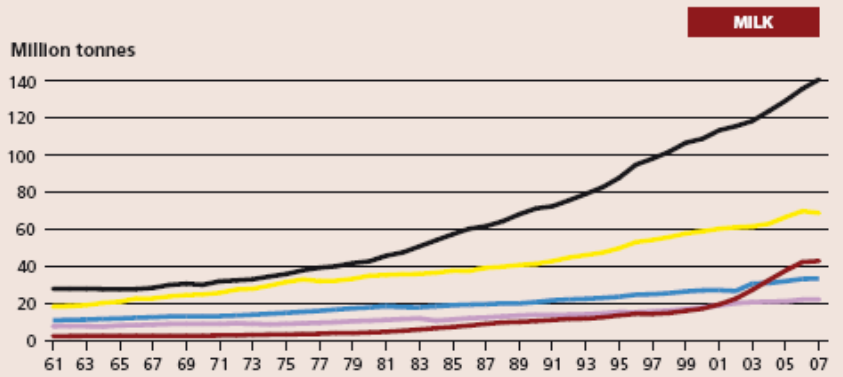
-Most rural families keep small free-range flocks

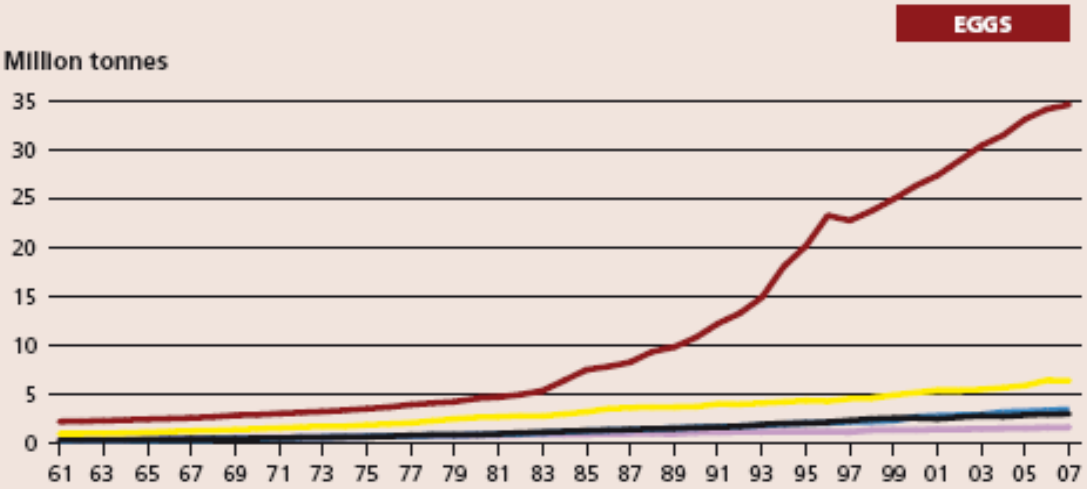
-Up to 80% of poultry raised at small-household level

FAO, 2005

Production of meat, eggs and milk by developing country region, 1961–2007





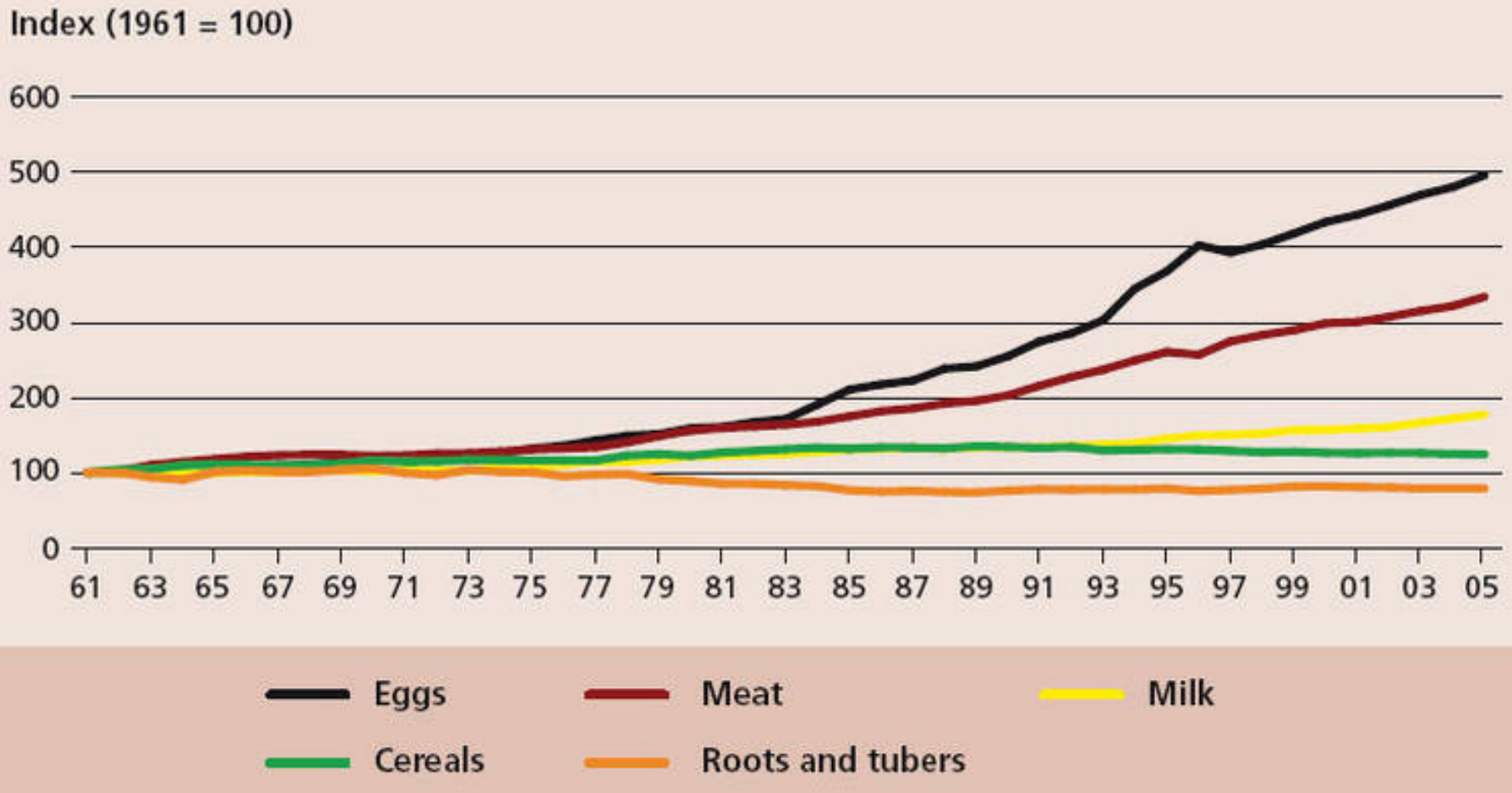


East and Southeast Asia
Latin America and the Caribbean
Near East and North Africa
South Asia
Sub-Saharan Africa

FAO SOFA, 2009

FIGURE 1

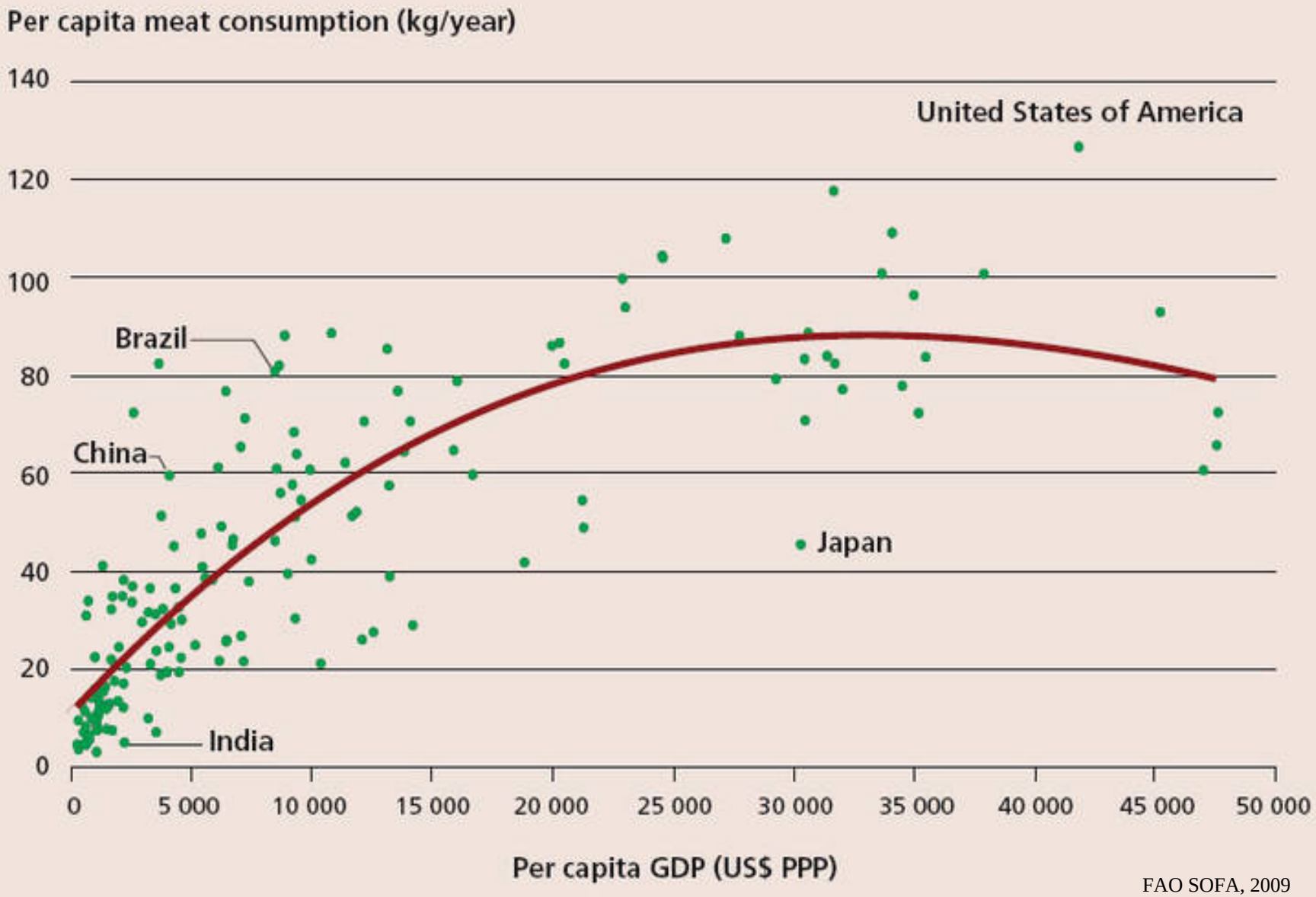
Per capita consumption of major food items in developing countries, 1961–2005



FAO SOFA, 2009

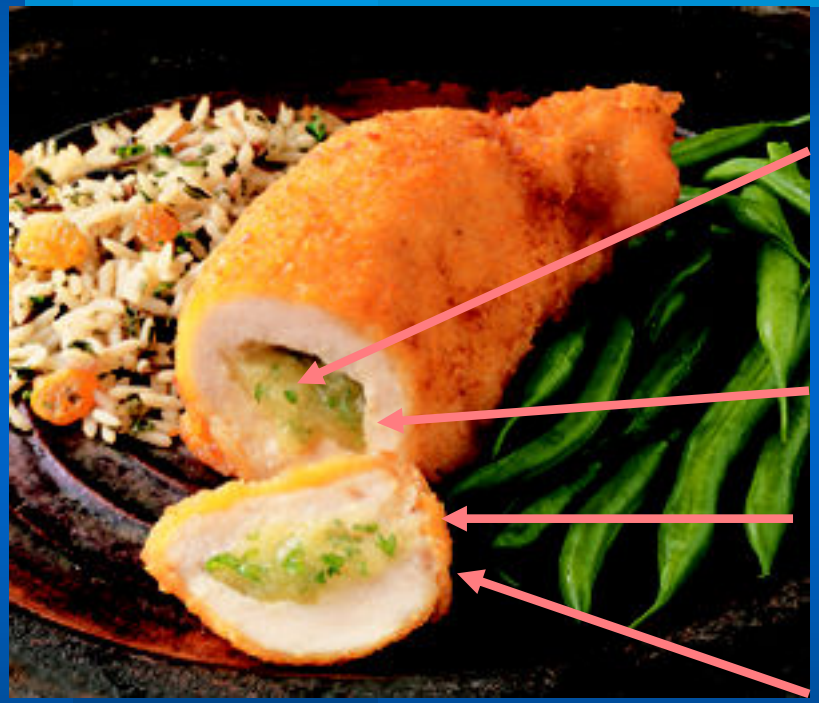
FIGURE 3

Per capita GDP and meat consumption by country, 2005



FAO SOFA, 2009

Globalisation of Trade :*"The World on your Plate"*



Chicken Kiev

Herb Butter

Salted butter	- Ireland
garlic puree	- China, USA, Spain
garlic salt	- China, USA, Spain
lemon	- USA
parsley	- France, UK
pepper	- Indonesia
water	- Ireland

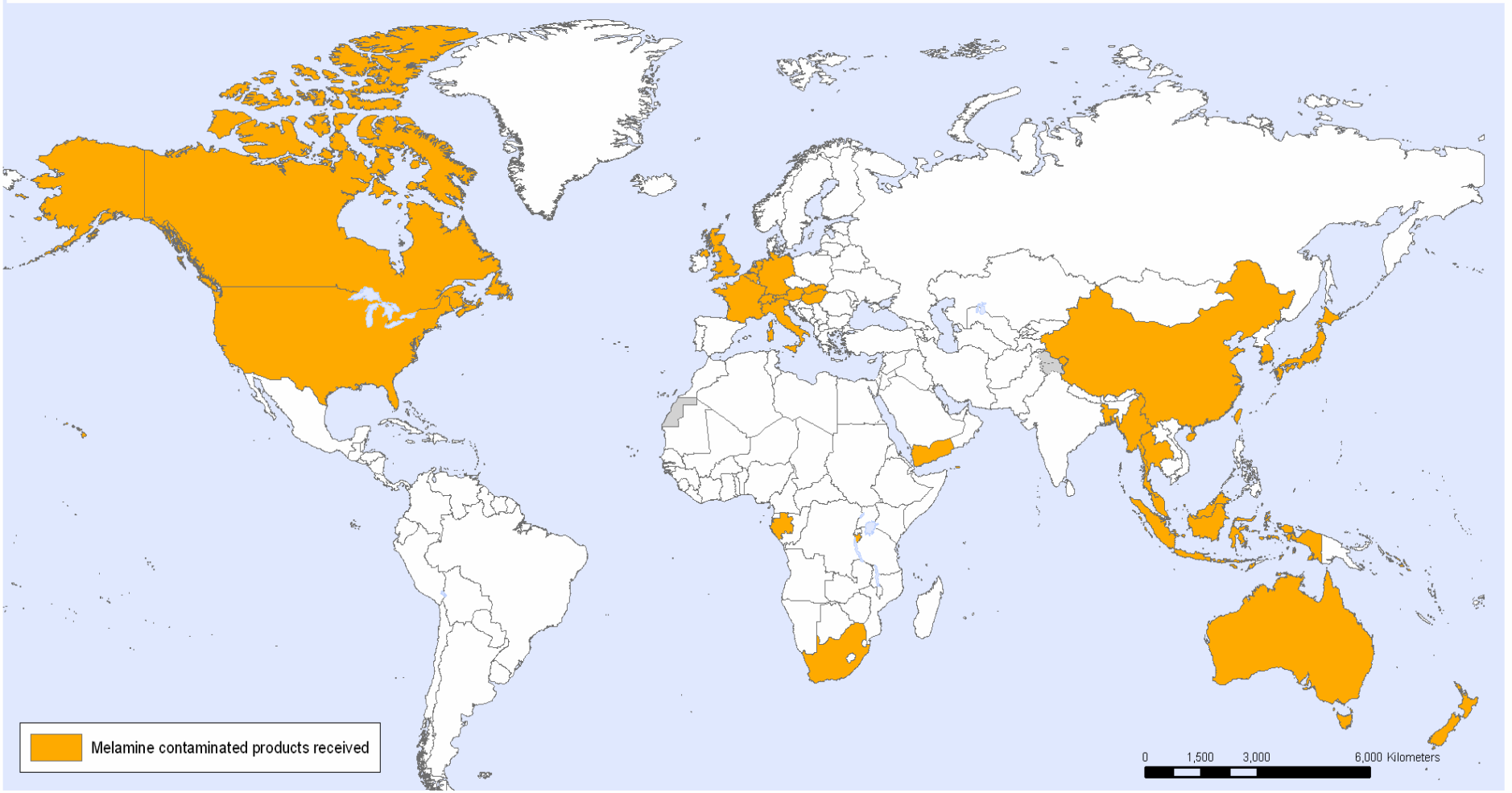
Chicken Breast: Chicken - Ireland, Belgium UK, France etc.

Batter: Flour - Belgium, France
Water - Ireland

Bread Crumb: Bread crumb - Ireland, UK
Rape-seed oil - EU, Australia Eastern Europe

Courtesy A. Reilly, FSAI, Ireland

Country received melamine contaminated products



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Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

World Health Organization

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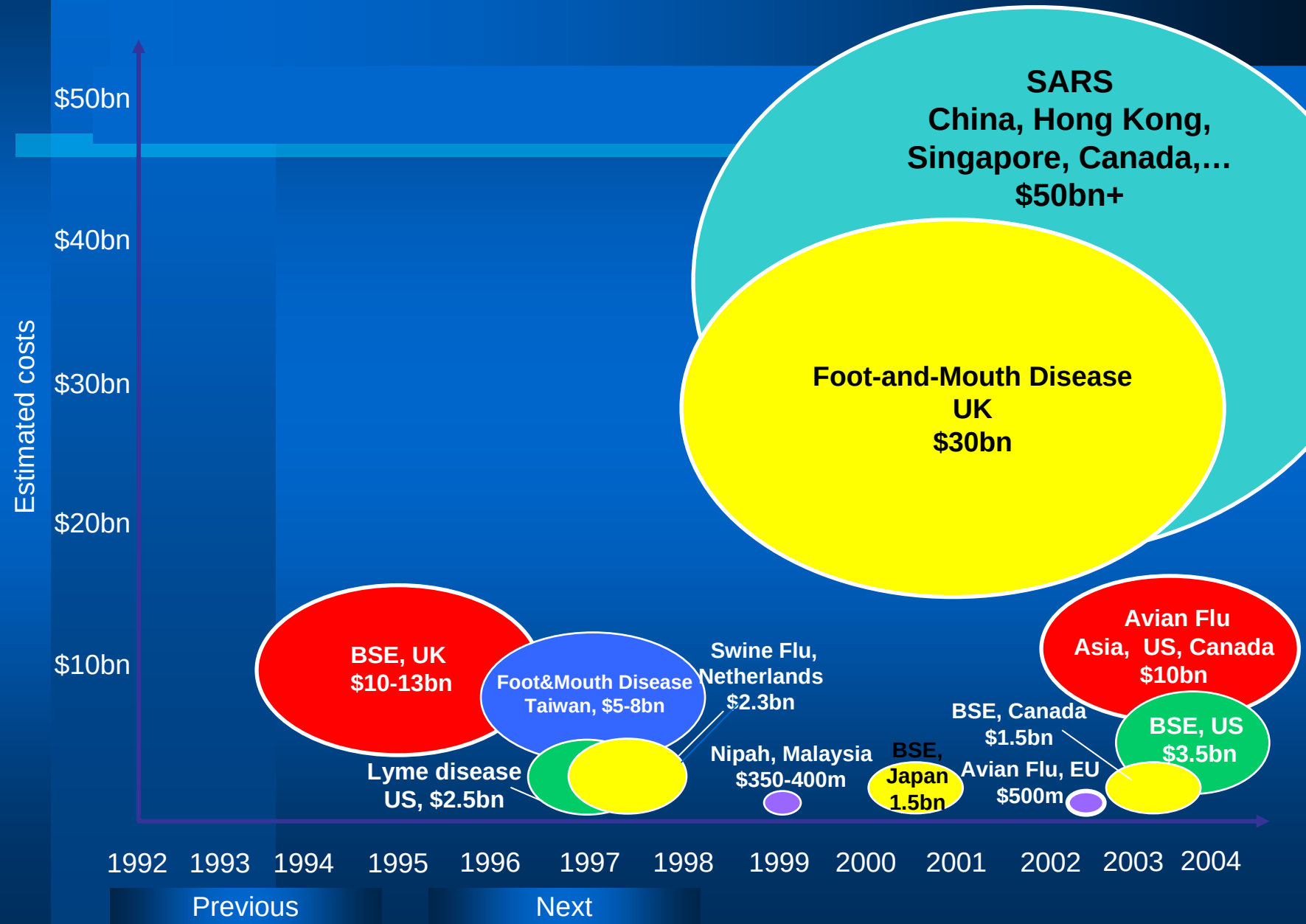
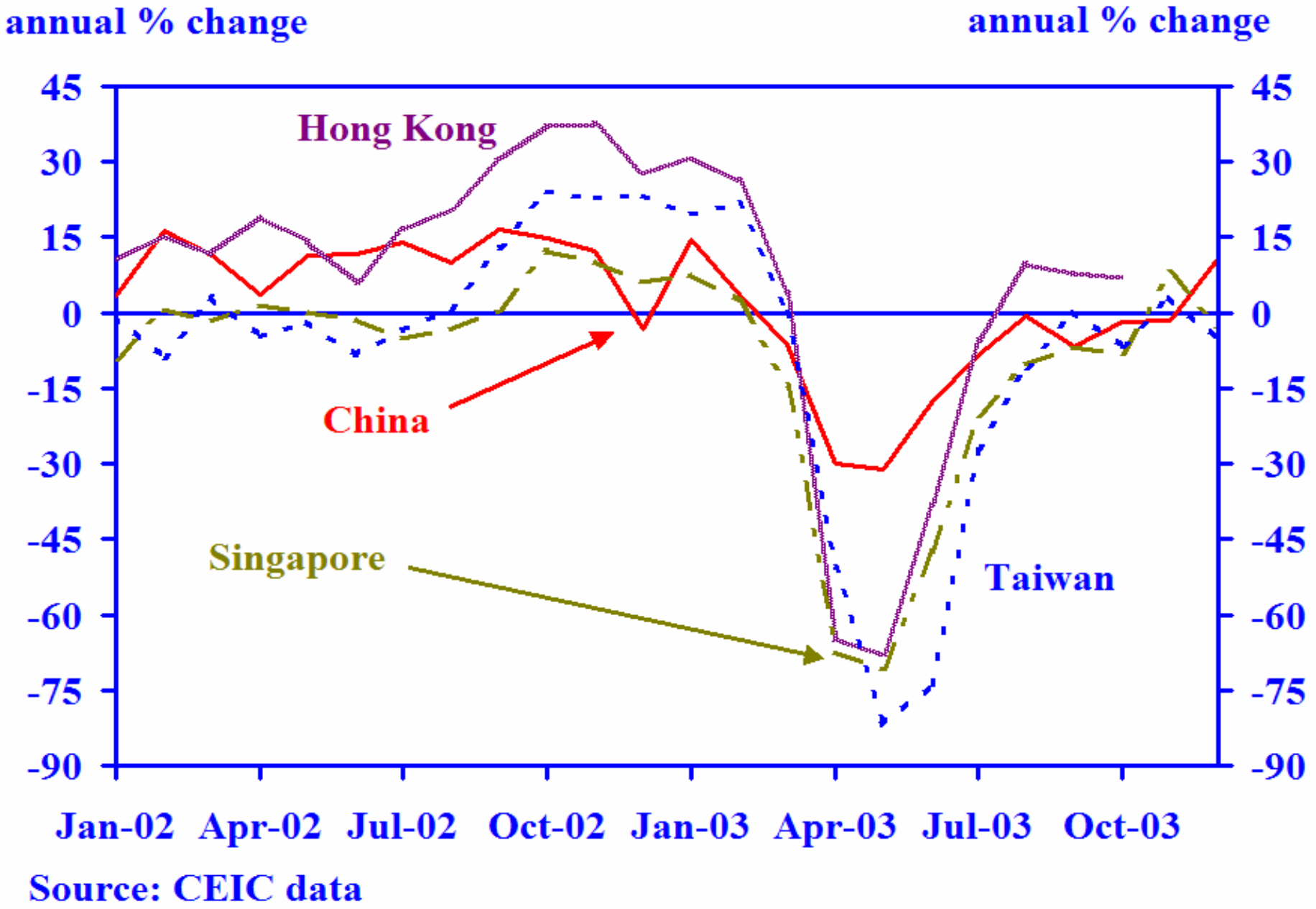
Economic Impact of Recent Epidemics



Asia: Tourist arrivals



Source: CEIC data

Content

World Health Organization

- The Changing environment and the emergences of new zoonoses
- Current main zoonoses of concerns in Asia
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Local Food Safety issues : Ex. Fish borne Parasites (*C. Sinensis*)

World Health Organization

- Over 40 million people world-wide infected

In China :

- National Infection rate (i.r.) : 0.37%
- In highly infected provinces: i.r. : 16-75%
- Guangxi province : i.r. 20%. (1.6-36%).
- Endemic provinces covers 572 M persons.
- Due to consumption of raw & lightly processed freshwater fish & crabs.

84 species of fresh water fish are susceptible to these parasites (trematodes)

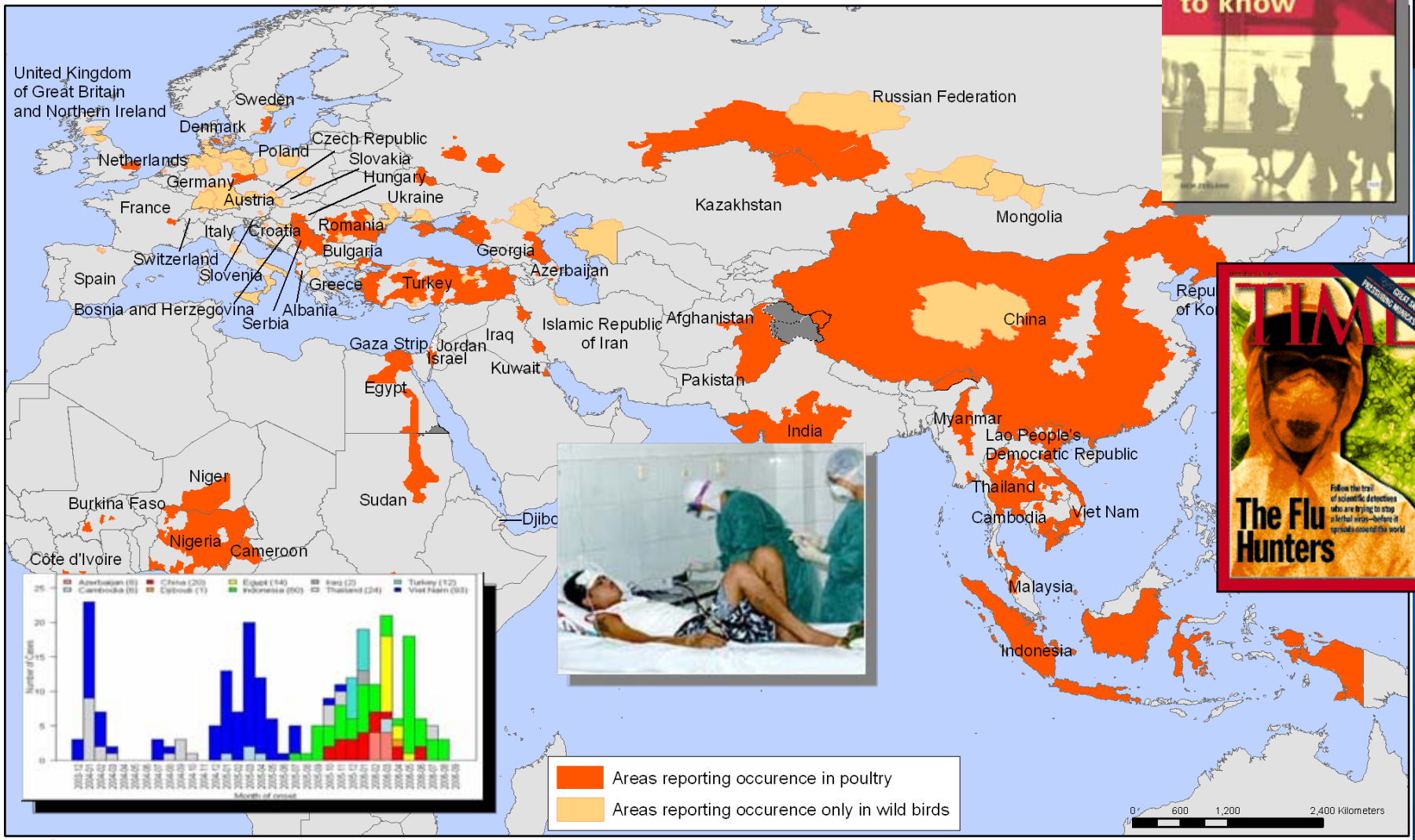
Foodborne parasites in China : Change in the epidemiology

World Health Organization

- Increase in living standards = increased infection rate :
  - People can now afford more easily expensive traditional raw fish dish.
  - Raw fish dish becoming more fashionable
- Difference between cities & country side diminish :
  - Infection rate increase with social status.
- Endemic areas expending :
  - Increased trade in live fish and contaminated fish fries.
  - Aquaculture expanding fast in endemic region like Guangxi.
- Problem may be exported :
  - Fresh water fish from endemic region is exported to Hong Kong, Macao, Korea, Japan, Malaysia, USA, Europe, Australia.
  - Live fresh water fish exported to Europe.

H5N1 Avian Influenza, Human cases, Pandemic Threat

Areas reporting confirmed occurrence of H5N1 avian influenza in poultry and wild birds since 2003



World Health Organization

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Data Source: World Organisation for Animal Health (OIE) and national governments

Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization

Confirmed Human Cases of Avian Influenza A/(H5N1)

Country	2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	2	2	1	1	1	0	1	0	1	1	10	8
China	13	8	5	3	4	4	7	4	1	1	39	26
Djibouti	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	18	10	25	9	8	4	39	4	22	9	112	36
Indonesia	55	45	42	37	24	20	21	19	6	5	168	139
Iraq	3	2	0	0	0	0	0	0	0	0	3	2
Lao PDR	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	0	0	8	5	6	5	5	5	7	2	119	59
Total	115	79	88	59	44	33	73	32	37	18	505	300

WHO

Asia's particularities : Live Animal Markets

World Health Organization


文明经商
礼貌待人


家禽区

Previous Next


Cases 265
Death: 105
Cf : 39.6%
Kota Baharu
George Town
Kuala Terengganu
Ipoh
Lumut
Strait of Malacca
September 1998
(Ampang, Tambun& Ulu Piah)
KUALA LUMPUR
Kuantan
Kelang
Port Dickson
Melaka
Johor Baharu

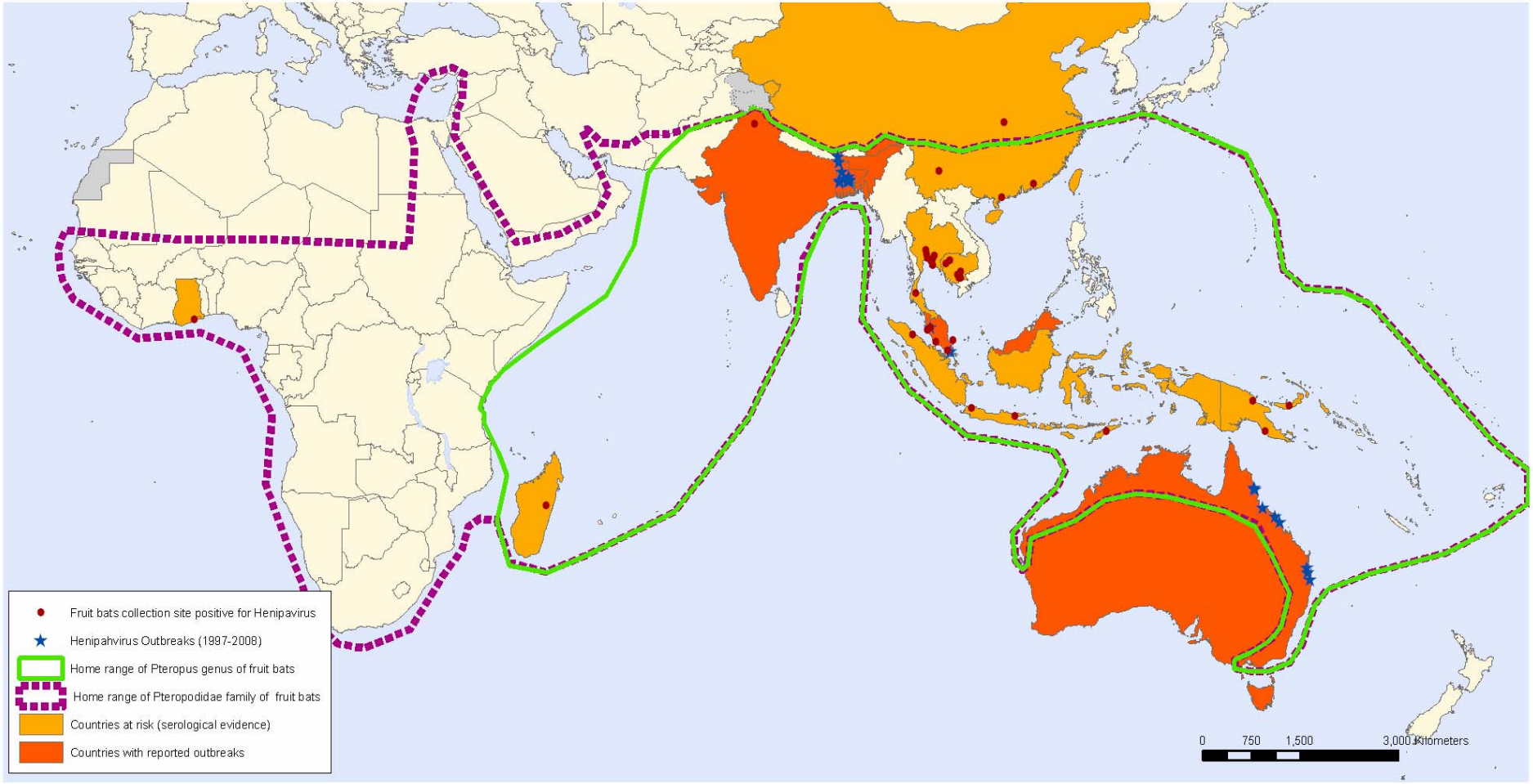
Nipah Virus, Malaysia, 1999; Bangladesh, 2004, 2005

« approximately 1.1 million pigs were destroyed which cost about US$97 million. The loss of export to Singapore and Hong Kong meant a loss of about US$120 million in 1999. In addition, local pork consumption during the peak of the outbreak dropped by 80 percent, a financial loss estimated to be about US$124 million during the outbreak period alone »

[total cost US$341 million]

Manual on the Diagnosis of Nipah Virus Infection in Animals. FAO Regional Office for Asia and the Pacific Animal Production and Health Commission for Asia and the Pacific (APHCA), January 2002

Geographic distribution of Henipavirus outbreaks and fruit bats of Pteropodidae Family



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World Health Organization

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Nipah virus transmission

- **Fruits or fruit products (e.g. raw date palm juice)**

-Bangladesh : date palm sap contaminated with urine from infected fruit bats
- fruit contaminated with saliva from infected fruit bats

- **Human-to-human transmission**

- direct contact with ill patients
- exposure to body fluids (secretions, excretions)
- one outbreak in hospital setting, Siliguri, India (hospital staffs or visitors)

- **Pig-to-human transmission**

- initial outbreaks only (Malaysia & Singapore)
- direct contact with ill, dying, dead pig or their tissues and secretions
- occasional transmission from other domestic animals (goat, sheep, cow,…)

Nipah virus in humans

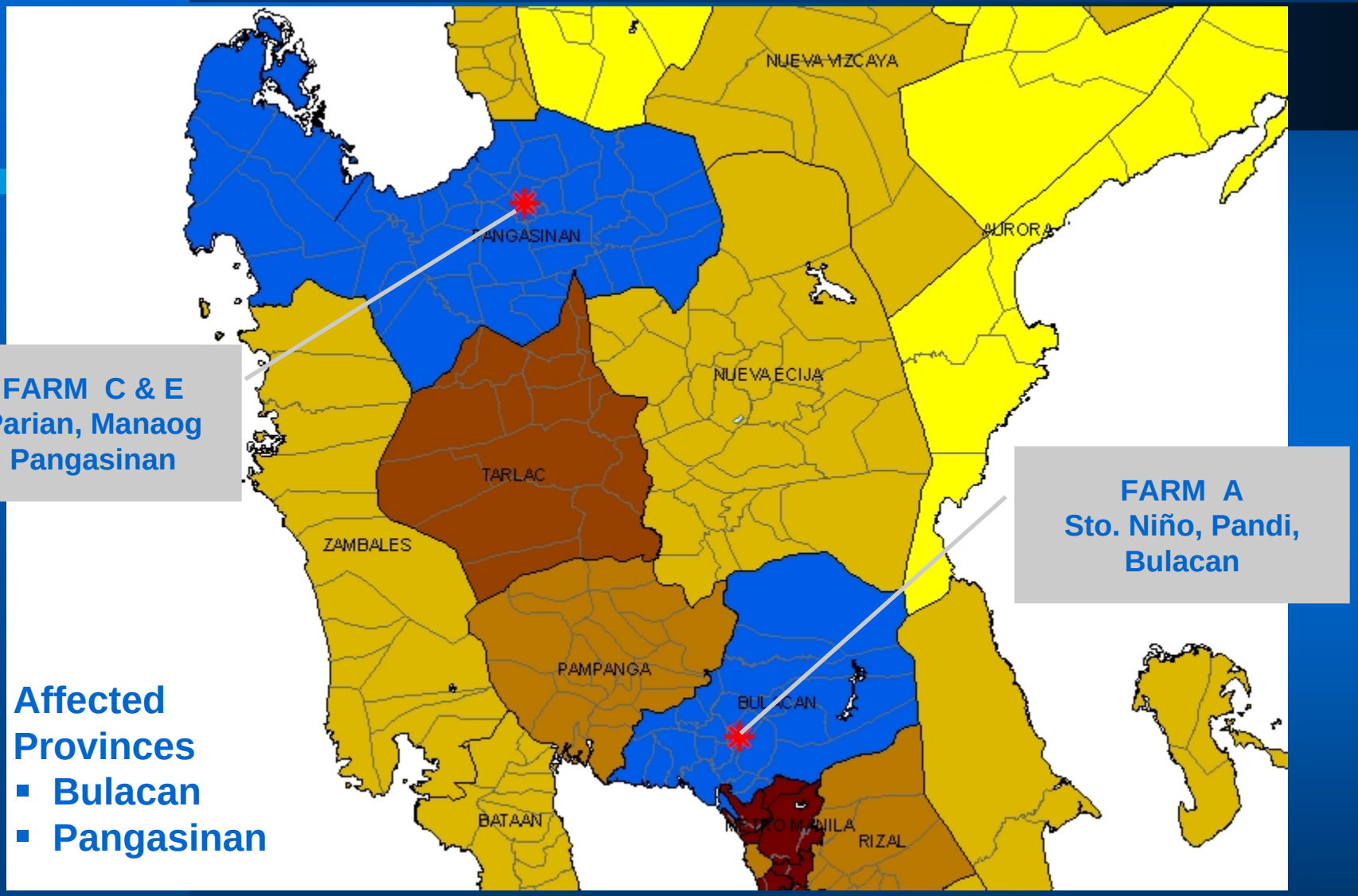
- Incubation period: 4 – 45 days

- Flu-like fever, headaches, vomiting, sore throat, Neurological manifestations and/or Respiratory manifestations (more frequent in later outbreaks). Asymptomatic infections have been reported
- Long term sequelae
- 80% whom survived acute encephalitis made full recovery
- 20% with residual neurological sequelae after NiV encephalitis : persistent convulsions, behavioural changes
- Small proportion of cases develops relapse or delayed encephalitis

18% mortality rate

Ebola Reston

- The Philippines is still the only known geographic source of Ebola Reston virus
- Until recently monkeys in one breading facility were the only spp known to be infected
- 2008 event of Ebola Reston in domestic pigs has triggered the ongoing investigations



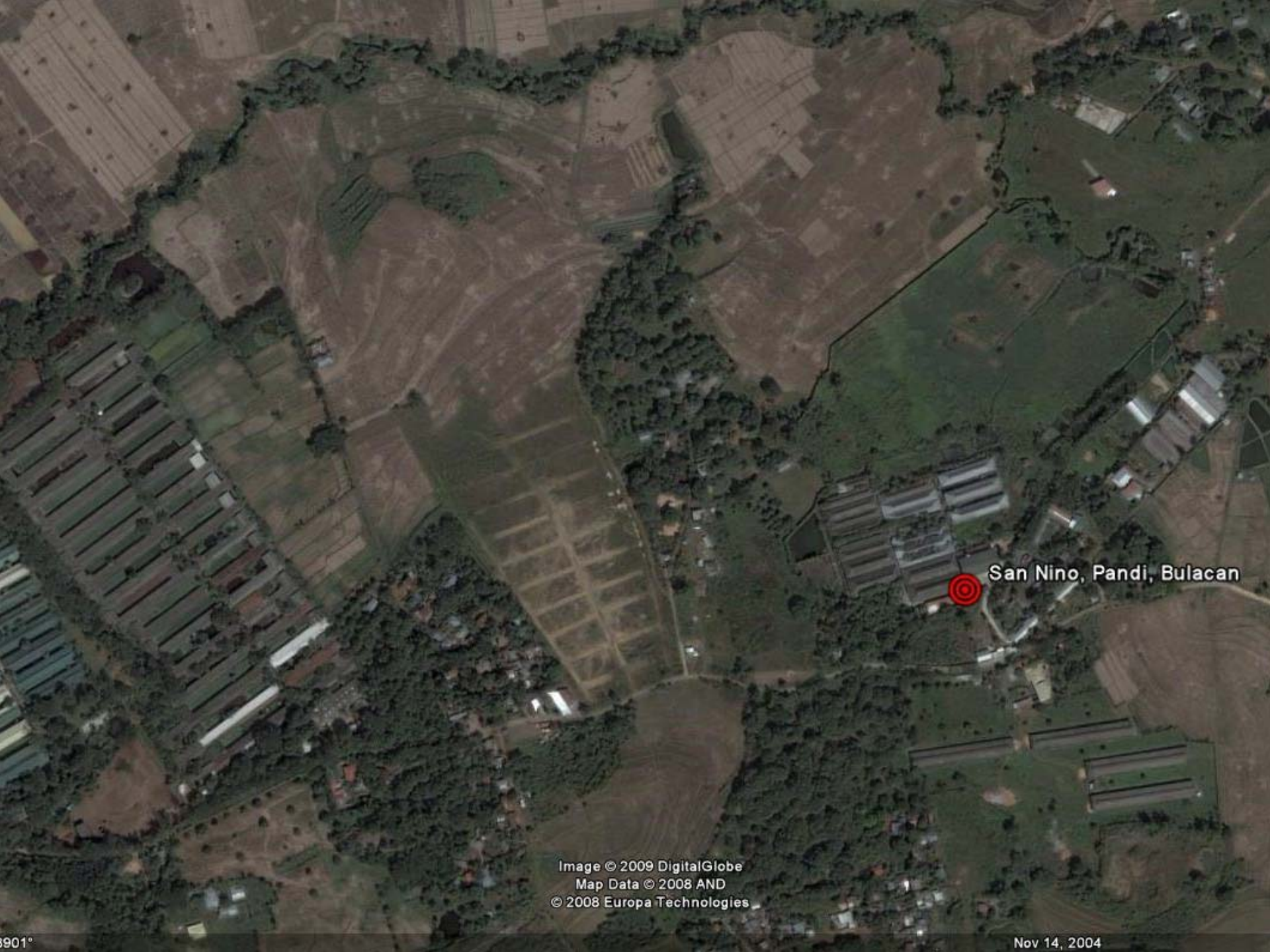
FARM C & E
Parian, Manaog
Pangasinan

FARM A
Sto. Niño, Pandi,
Bulacan

Affected Provinces

- **Bulacan**
- **Pangasinan**

Previous Next


San Nino, Pandi, Bulacan
Image © 2009 DigitalGlobe
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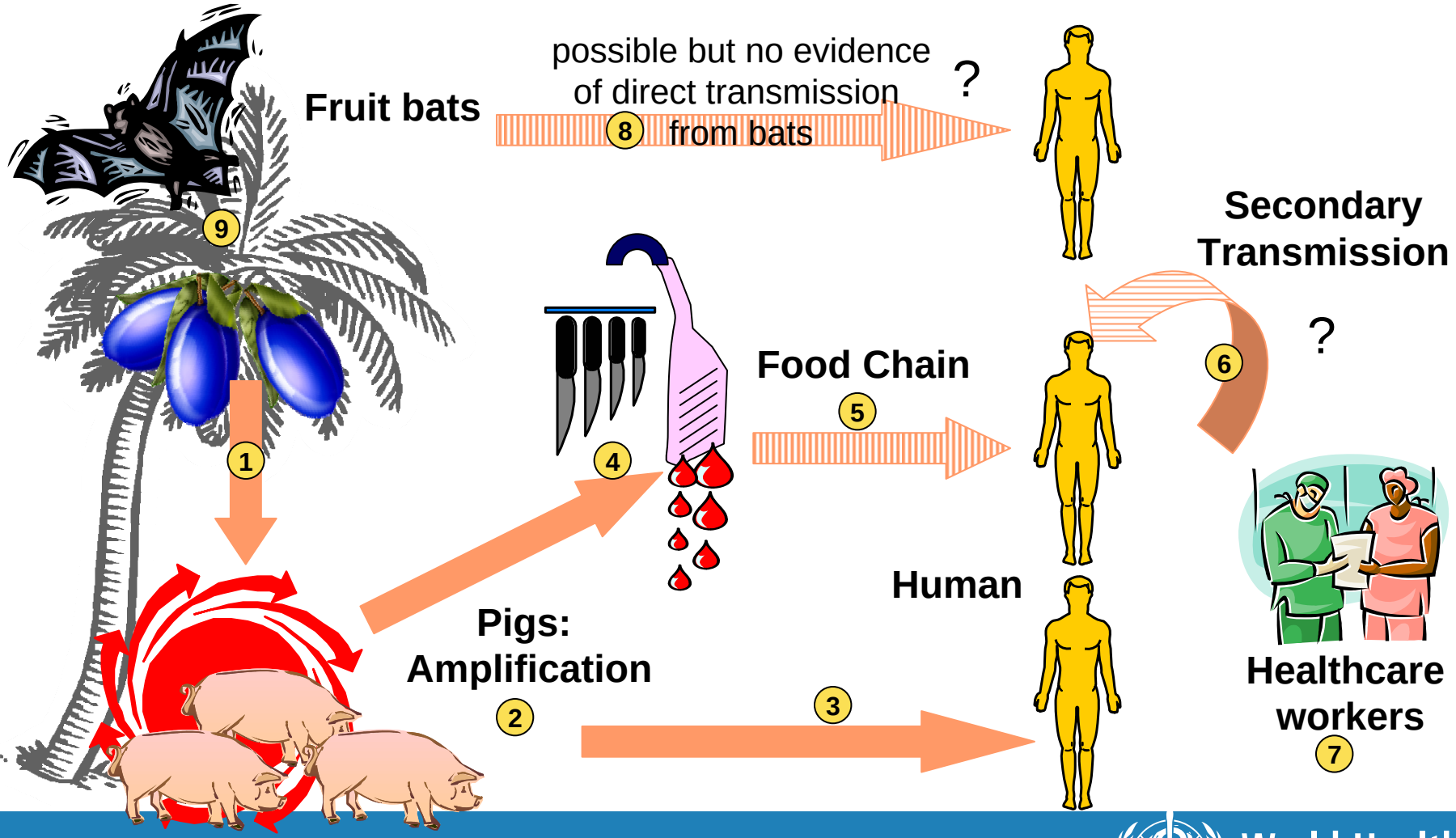
Nov 14, 2004

An hypothesis for the transmission of Ebola Reston in pigs 2008.



Courtesy P. Formenty, WHO

World Health Organization

Reston ebolavirus

- First finding in a food animal
  - Persistence in meat and by-products ?
  - Fate during processing ?
  - At risk groups along the food chain ?
  - Public fear & management issues

At-risk population groups

- Farm workers
  - Evidence of farm workers infected with *Reston ebolavirus*
  - Some operations probably carry a higher risk (e.g. farrowers,..)
- Slaughterhouse workers
  - Evidence of slaughterhouse workers infected with *Reston ebolavirus*
  - Exposed to blood, aerosols, body fluids, faeces…
- Meat handlers/food processing workers
  - Cut and handle raw meat and carcasses
  - Frozen meat cut with chainsaws can produce aerosols.

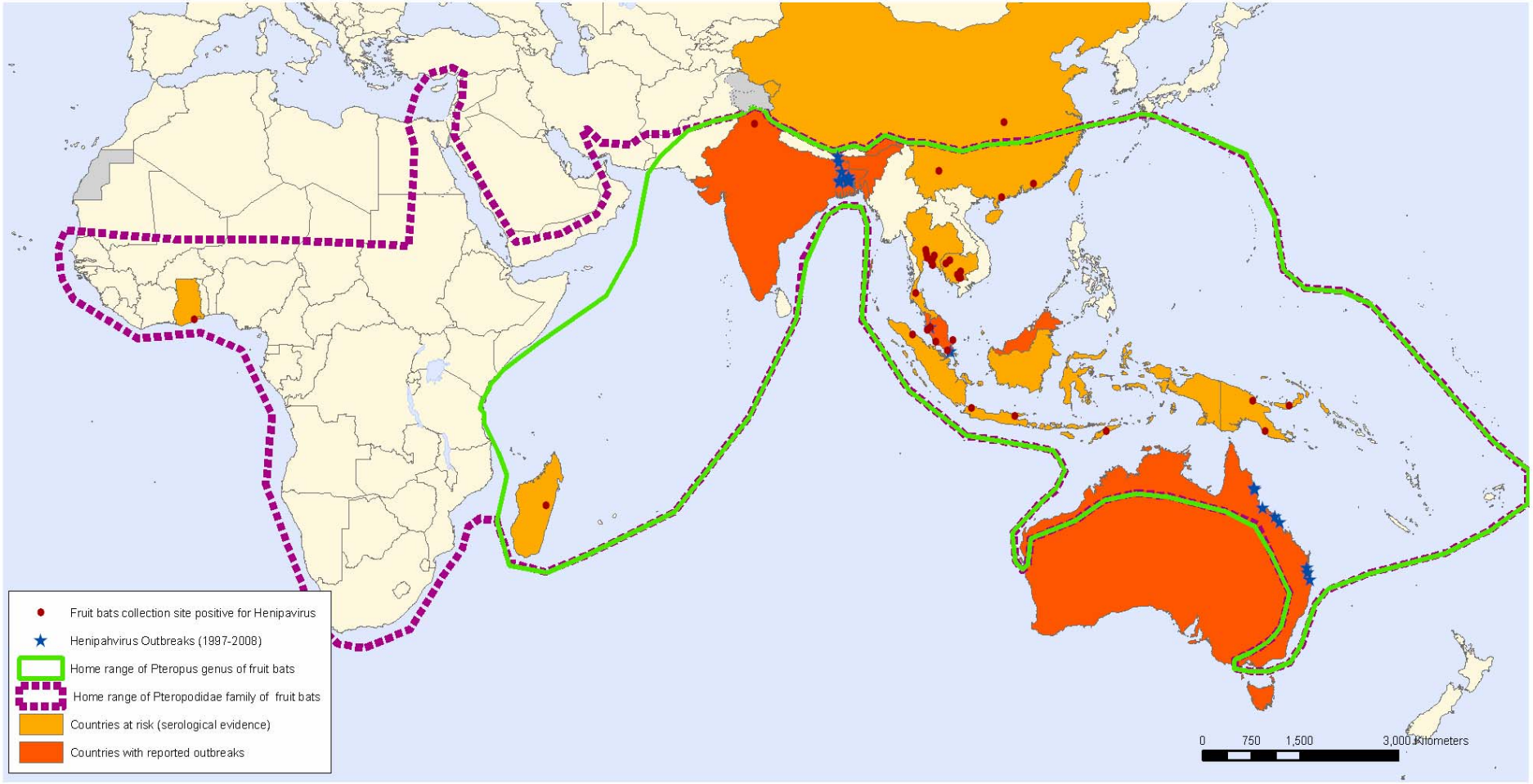
Arrival and inspection at the slaughterhouse

At-risk population groups (2)

World Health Organization

- Backyard farmers and their families
  - Often carries all the high risk operations described above.
  - Most pigs are produced in backyard settings
    - Up to 80% in many countries of the region.
  - Most backyard pigs never see a veterinarian or animal health agent.
    - In China in 2000, approx. 1% of slaughtered pigs would have been seen by a veterinarian during their life or after.
  - Biosecurity often absent
  - Fruit trees most often present
  - Sick/dead pigs are often slaughtered for consumption

Geographic distribution of Henipavirus outbreaks and fruit bats of Pteropodidae Family



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Public fear and Management challenges

- Ebola virus in a food animal
  - Public perception and large uncertainties surrounding the risks associated with *Reston ebolaviruses* in pigs
    - E.g. sharp drop in consumption of poultry products during outbreaks of Avian influenza
  - Pigs and pig products (semen) widely traded internationally – potential for spread of *Reston ebolavirus*
  - *Reston ebolavirus* in pigs : clinical signs or asymptomatic ?
  - Regulatory and logistical issues during culling/depopulation


cky Fried Chicken
KFC
KFC
RESTAURANT
Londra e mai apro
95€

Content

World Health Organization

- The Changing environment and the emergences of new zoonoses
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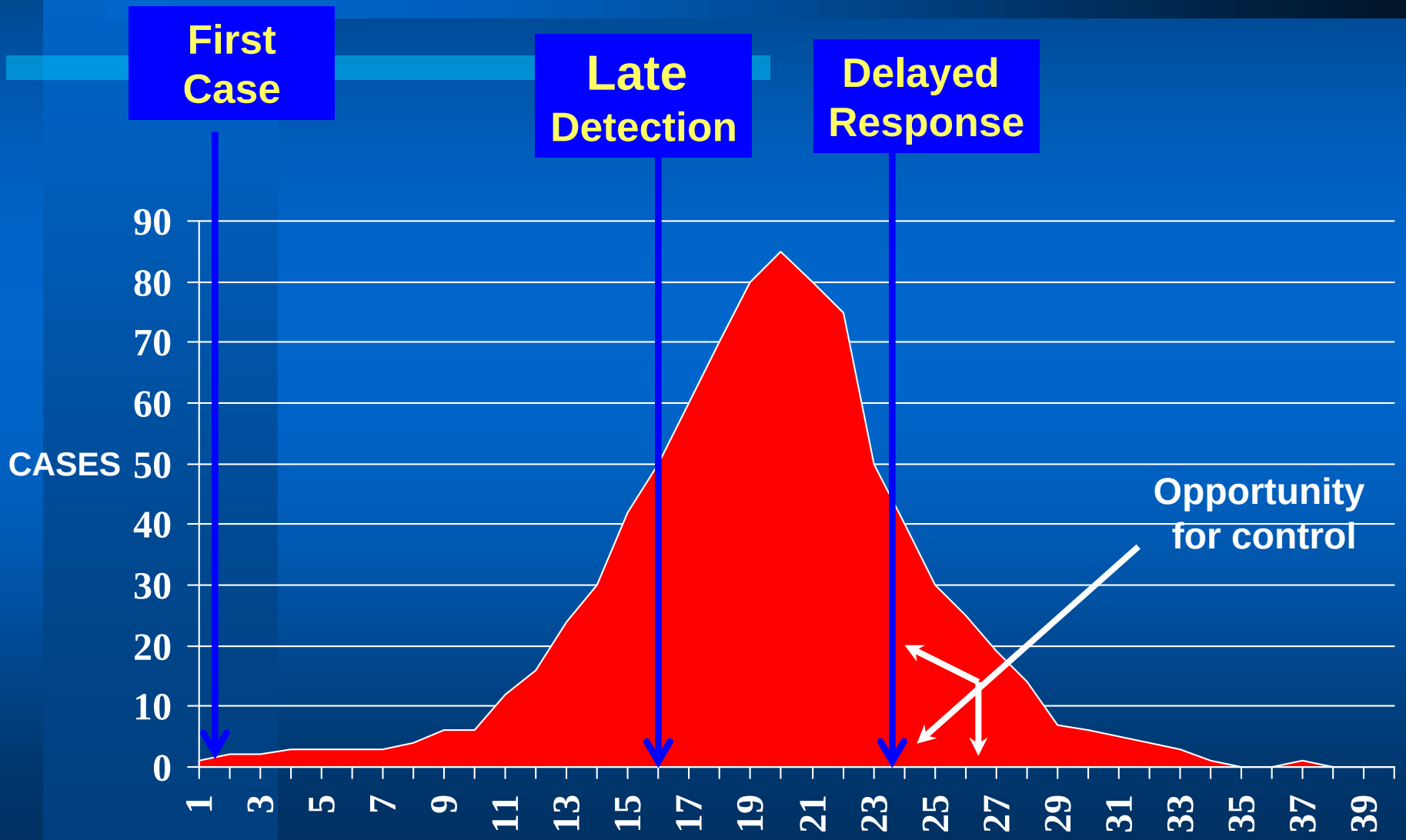
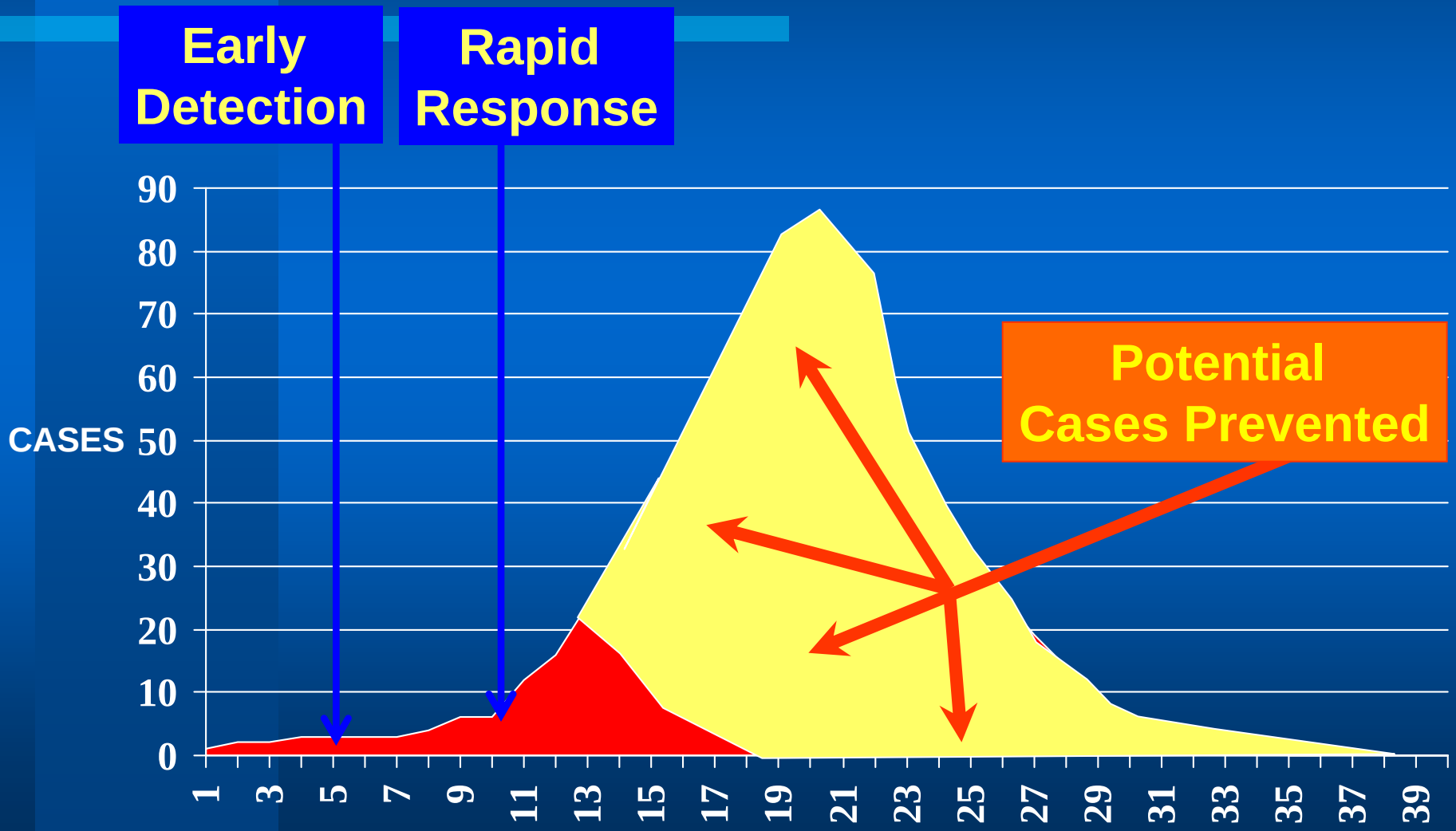
Outbreak Alert and Response



Outbreak Alert and Response



International Health Regulations (IHR)

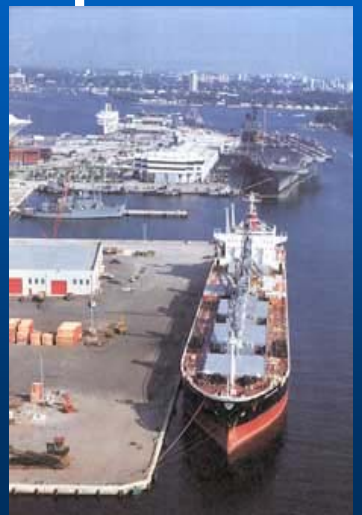
- Old IHR (1969) only covered Yellow Fever, Cholera and Plague
- New IHR (2005) include ***all public health emergencies of international concern*** - including those caused by food
- IHR (2005) entered into force on 15 June 2007
- All WHO Member States are obliged to declare all public health emergencies of international concern to WHO

International Health Regulations (2005)

Key Changes

World Health Organization

- Cover all "**public health emergencies of international concern**" including food contamination events
- Country capacity requirements: EWARS
- Reports from sources other than Member States (media, private sector, NGOs, etc.)
- WHO **24-hour operations** through **country focal points**
- Emergency Committee
- Review Committee



Notification / Decision Instrument

World Health Organization

In practice, what generally must be notified?

- **All cases: new subtype human influenza, wild-type polio, SARS, smallpox**
- **All events involving at least 2 of 4 criteria:**
  1. Potentially severe public health impact
  2. Unusual or unexpected nature
  3. Significant risk of international spread
  4. Significant risk of restrictions on international travel or trade (including an imported/exported food product)
- **Any health measures implemented in response to the event to WHO**
- **Events involving certain diseases are specifically required to be assessed**

One Mechanism in WHO

- **Identify events of potential international public health concern**
- **Verify with affected country**
- **Assess risk to international community**
- **Disseminate information to those who need to know**
- **Assist affected country**

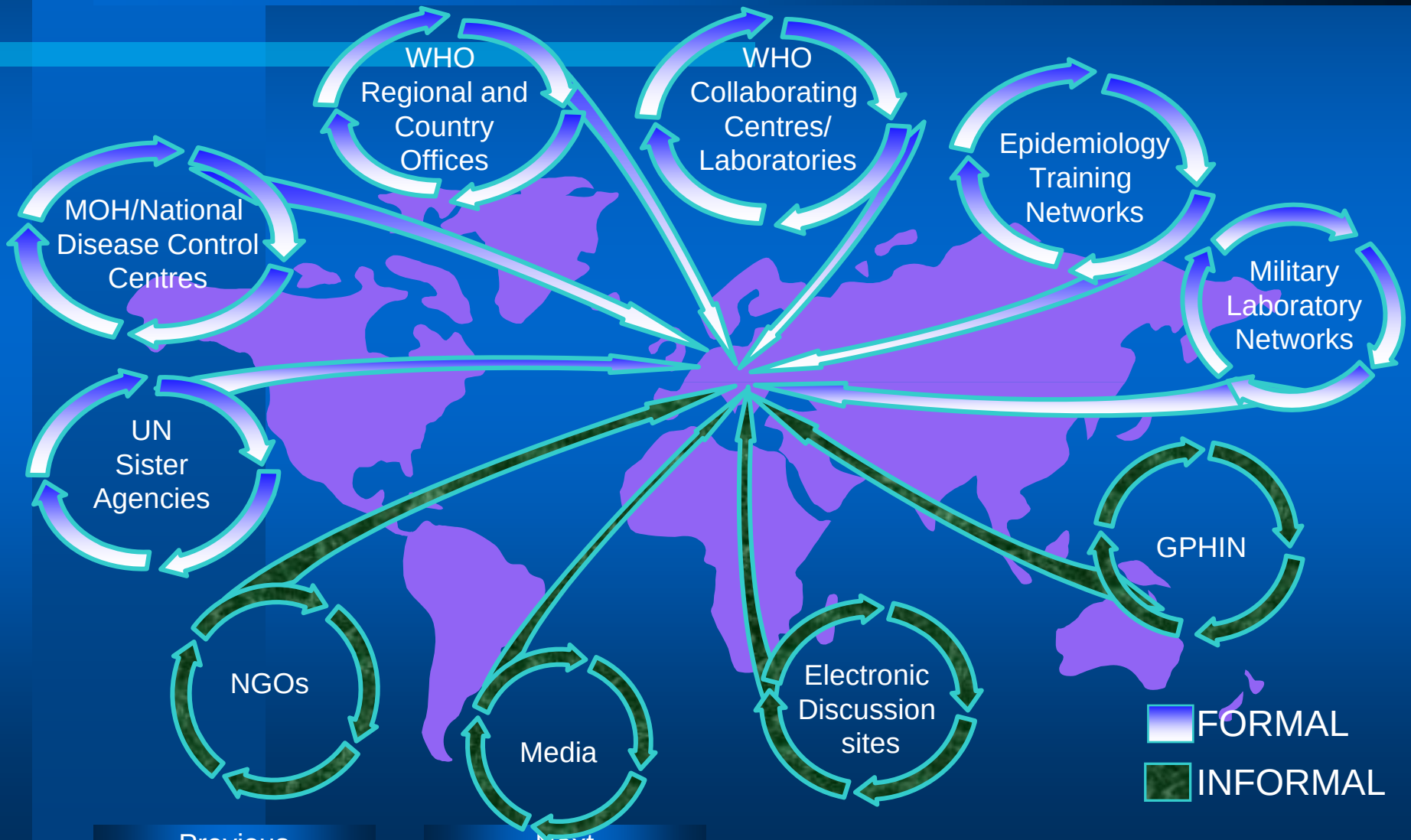
Global Event Management System

Surveillance and Risk Assessment → **Response** → **Analysis**

- **Support and facilitate the WHO *Organization-wide* event management process.**
- **Inform and document key decisions.**
- **Accommodate and promote IHR(2005) specific activities and reporting.**

Department of **Epidemic and Pandemic Alert and Response**

Global Alert for Emerging Diseases: Network of Networks



Unintentional contamination outbreaks

World Health Organization

- *S. typhimurium* in pasteurized milk in 1985, USA : 170 000 people
- *Hepatitis A* in raw clams in 1991 in Shanghai, PR China : 300 000 people
- *S. enteritidis* in pasteurized pre-mix ice cream in 1994 in 41 states, USA: 224 000 people
- Chemical agent in cooking oil in 1981 in Spain: 800 death and 20 000 people injured
- *E. coli 0157:H7* in US sprouts in 1996 in Japan: 8000 school children
- *Cyclospora* in raspberries from Guatemala in 1996-1997 in the USA
- *Shigella* in baby corn from Thailand in 2007 in Denmark and Australia
- Melamine in infant formula in 2008 in China : 300 000 children affected

Deliberate/accidental contamination of Food *one global market*

- **Contamination events will not be prevented through border control**
- **Early detection will most likely not be achieved through border control**
- **New – and more efficient - food safety systems try to focus on preventative efforts as close to the source as possible (e.g. HACCP)**
- **Many food contamination events have international implications**
- **Capacity to prevent and detect need to be build in all countries**
- **– reinforcing the need to use an international system**

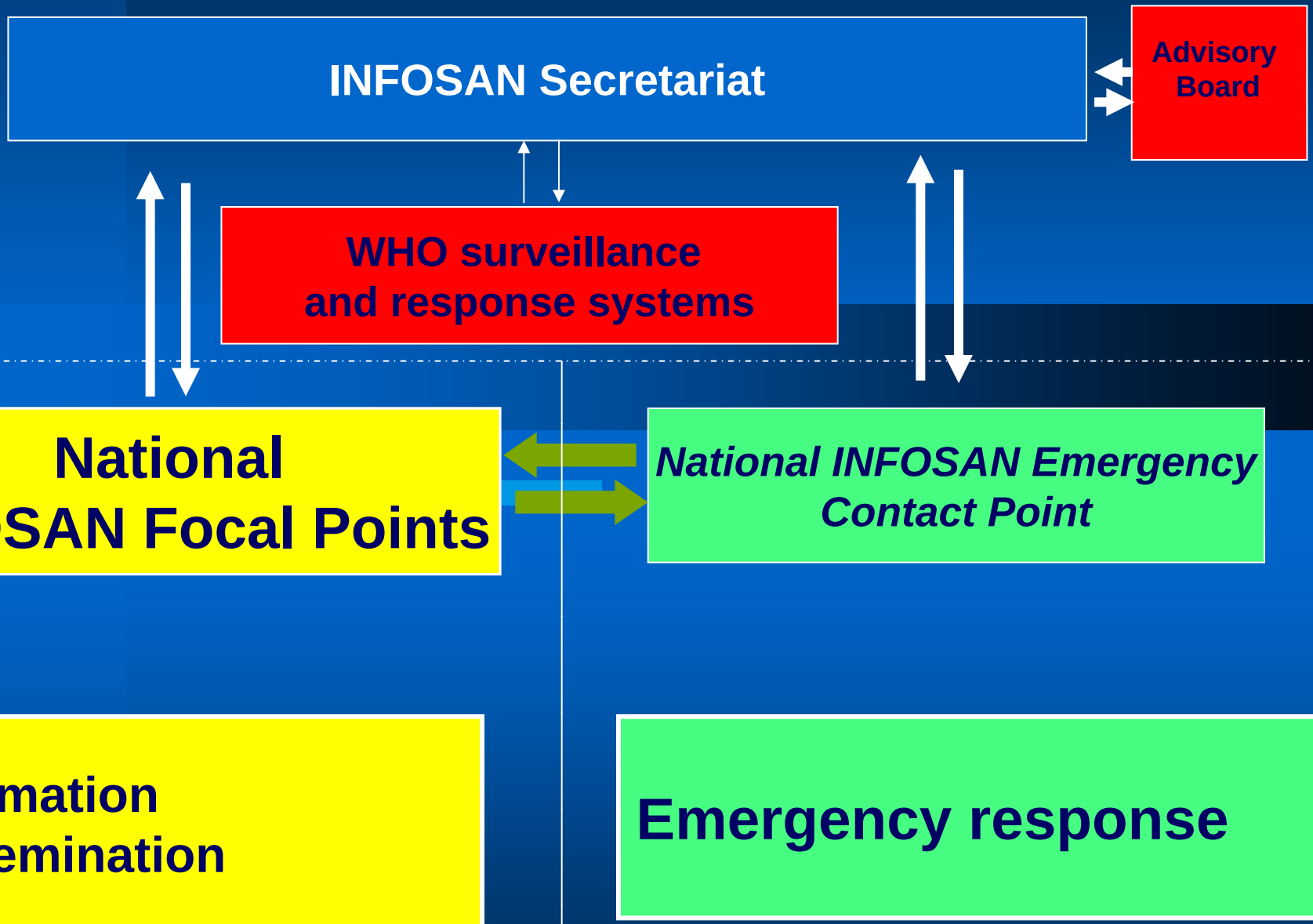
INFOSAN

A global network of 177 national food safety authorities to:

- **Promote the exchange of important food safety information globally**
- **Respond to international food safety events**
- **Help countries strengthen their capacity to manage food safety risks**

with a goal of preventing foodborne disease

Structure of the INFOSAN Network



Examples of INFOSAN Emergency ALERTS

- July 2005 *Salmonella* in Powdered infant formula from France to 13 countries
  - Most countries reported that they received official info from INFOSAN only
- September 2006 *E.coli* 0157:H7 in spinach to all members of INFOSAN
  - Because of possible secondary and tertiary distribution, all INFOSAN member countries were notified.
- September 2007 *Shigella sonnei* contamination of baby corn exported to five countries
  - The entire network was utilised to identify associated cases
  - Importing countries who were unaware of the contamination were notified
- September 2008 Melamine in Infant formula and processed foods exported to more than 30 countries.
  - All INFOSAN member countries were notified and regularly kept informed
- January 2009 Ebola Reston in Pigs, Philippines
  - All INFOSAN member countries were notified due to the unexpected nature of the event.

Experiences from around the world

World Health Organization

- Effective food control are undermined by fragmented legislation, multiple jurisdictions, and inconsistencies in enforcement
- No clear shared responsibilities by national governments, farmers, food processors and manufacturers, food retailers, caterers and consumers.
- The development of effective national multi-disciplinary, inter-agency networks along the food chain are hampered by disagreements regarding areas of competence of national authorities.

For further information :

World Health Organization

Internet :

http://www.who.int/foodsafety

E.mail:

benembarekp@wpro.who.int