Food and Agriculture Organization of the United Nations

Animal Production and Health Division

Building Local, State, National & International Early Warning Systems

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Outline of presentation

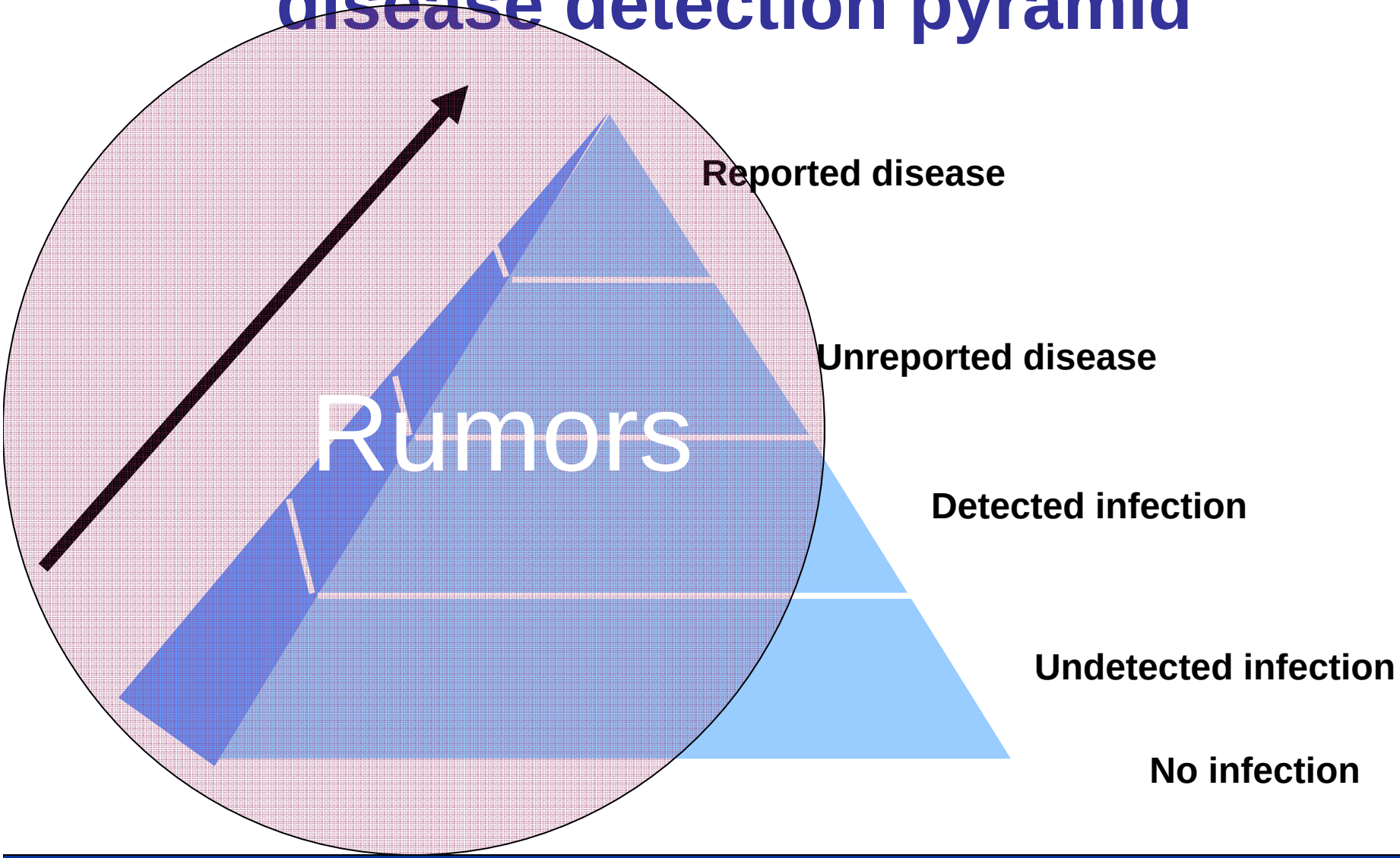
Early warning in its context at:

- international level
- national level
- local/community level

Early Warning at International Level

- IHR – International Health Regulations – Official notification of human diseases (WHO)
- WAHIS – World Animal Health Information System- Official reporting of specific animal diseases (OIE)
- PROMED, GPHIN, GLEWS – Rumor tracking

Surveillance systems and the disease detection pyramid



Global Early Warning and Response System for Major Animal Diseases including Zoonoses (GLEWS)

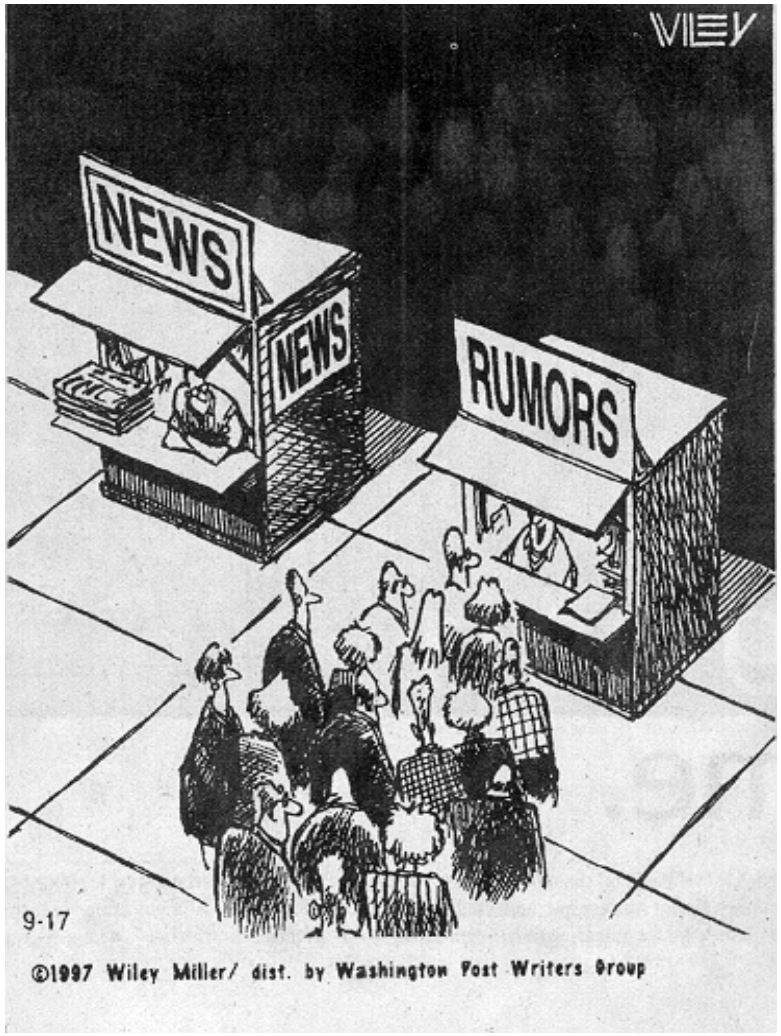




GLEWS

An early warning system that brings together human and veterinary public health systems

- to **share** zoonotic disease outbreak **information**
- to **share** epidemiological and risk **analysis**
- to **deliver** early warning **messages** to the international community on areas at risk of TAD



Internet is an increasing source of outbreak-related information

Other sources of information

- country or regional project reports
- field mission reports
- partner NGOs
- cooperating institutions
- government Ministries of Agriculture and Health
- FAO in-country representations
- other United Nations parties
- public domains
- the media
- web-based health surveillance systems

EMPRES WATCH

emergency prevention systems

Climate models predict increased risk of precipitations in the Horn of Africa for end of 2008

FAO and WHO warn countries in Africa and the Arabian Peninsula that Rift Valley Fever may strike again at the end of 2008

1. INTRODUCTION

Rift Valley Fever (RVF) is an arthropod-borne viral disease associated with high rates of abortion and neonatal mortality in ruminants and influenza-like illness in humans that may progress to neurologic, ocular, or hemorrhagic disease and death. The vast majority of human infections result from direct or indirect contact with the blood or organs of infected animals. Human infections have also resulted from the bites of infected mosquitoes. Ruminant infections occur in areas of high competent vector populations. Adult animals may be asymptomatic or develop mild disease that is typically first noted with the occurrence of abortions in the flock but some breeds, especially local ones, are more resistant to disease. Neonatal and young animals are more severely affected with a high mortality rate. The disease is transmitted by several different types of arthropod vectors (*Culex*, *Aedes*, *Anopheles*, *Mansonia*, *Eretmapodites*, *Culicoides*), with mosquitoes of the *Aedes* genus serving as the virus reservoir in nature through transovarial transmission. These infected eggs can survive through years of drought or desiccation. During increased precipitation, low-lying mosquito-breeding habitats are flooded, and the reservoir vectors re-emerge. Then the virus is amplified in domestic ruminant hosts, additional arthropod species can transmit the virus to other susceptible hosts including man. This increase of viral activity initiates a rapid spread of the disease.

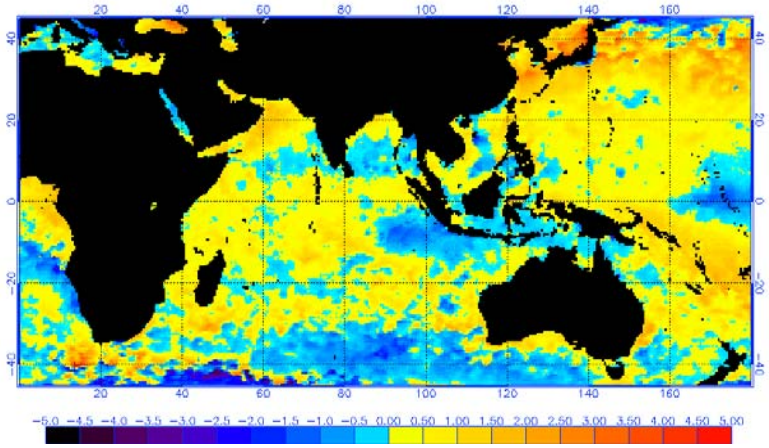
RVF has been documented in most sub-Saharan African countries, as well as Egypt and the Arabian Peninsula. The virus occurs in a variety of ecotypes and can spread to new geographic areas with animal movement. Previously affected areas must be considered endemic. In rainforest ecological zone, such as central African countries, the disease can be observed regularly with low incidence of disease. In semi-arid and arid regions of the Horn of Africa, large epidemics of RVF occur following periods of unusually high rainfall and flooding in 5 to 15 year cycles that have been associated with global climatic events and especially El Niño. Once spread to a new area, RVF can cause significant disease and economic loss in an immunologically naïve animal population. This scenario has occurred several times in newly affected areas, such as the emergence of RVF in 1977 in Egypt or in 2000 in the Arabian Peninsula.

CONTENTS

2. CLIMATIC FORECASTING OF DISEASE

The disease ecology of RVF in East Africa has been extensively studied. Following a period of persistent, heavy rainfall, the breeding habitats of *Aedes* floodwater species, such as the temporary ground pools known as *dambos* in Kenya, become flooded and promote the hatching of mosquito eggs. Eggs lain by RVF infected females harbour the virus and produce adult mosquitoes capable of infecting vertebrate hosts and propagating disease outbreak.

Historical data regarding sea-surface temperatures (SST) have found an association between anomalous SST, where the difference between weekly SST and historical average SSTs is measured, and heavy rainfall in East Africa. Concurrent positive western Indian Ocean SST anomalies and equatorial Pacific SST anomalies have occurred in conjunction with significant disease outbreaks in 1982-3, 1997-8, and 2006-7. Such events have also been associated with *El Niño* events and more



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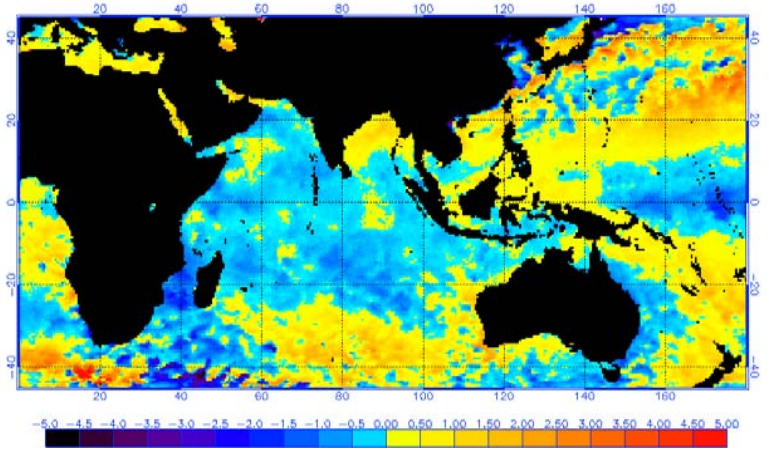

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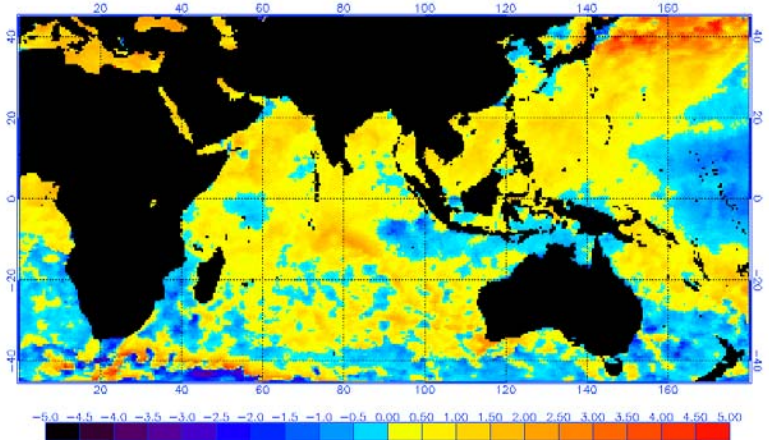


Country ‘status’

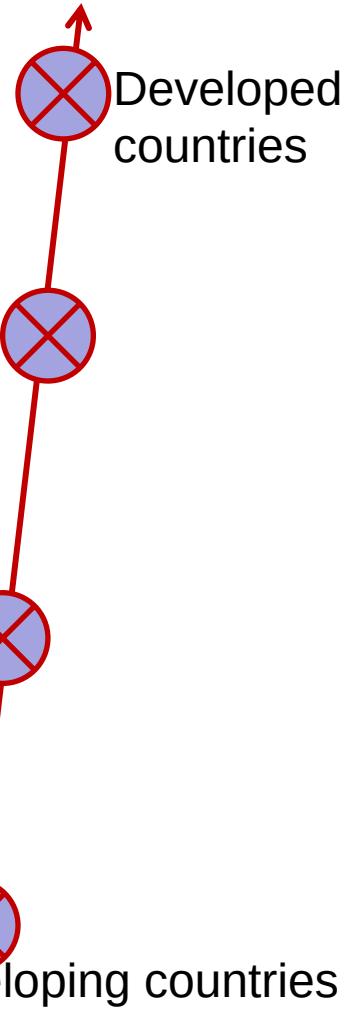
Burden diseases
→ basics health services

+

Episodic diseases
→ ED / EW / RR systems

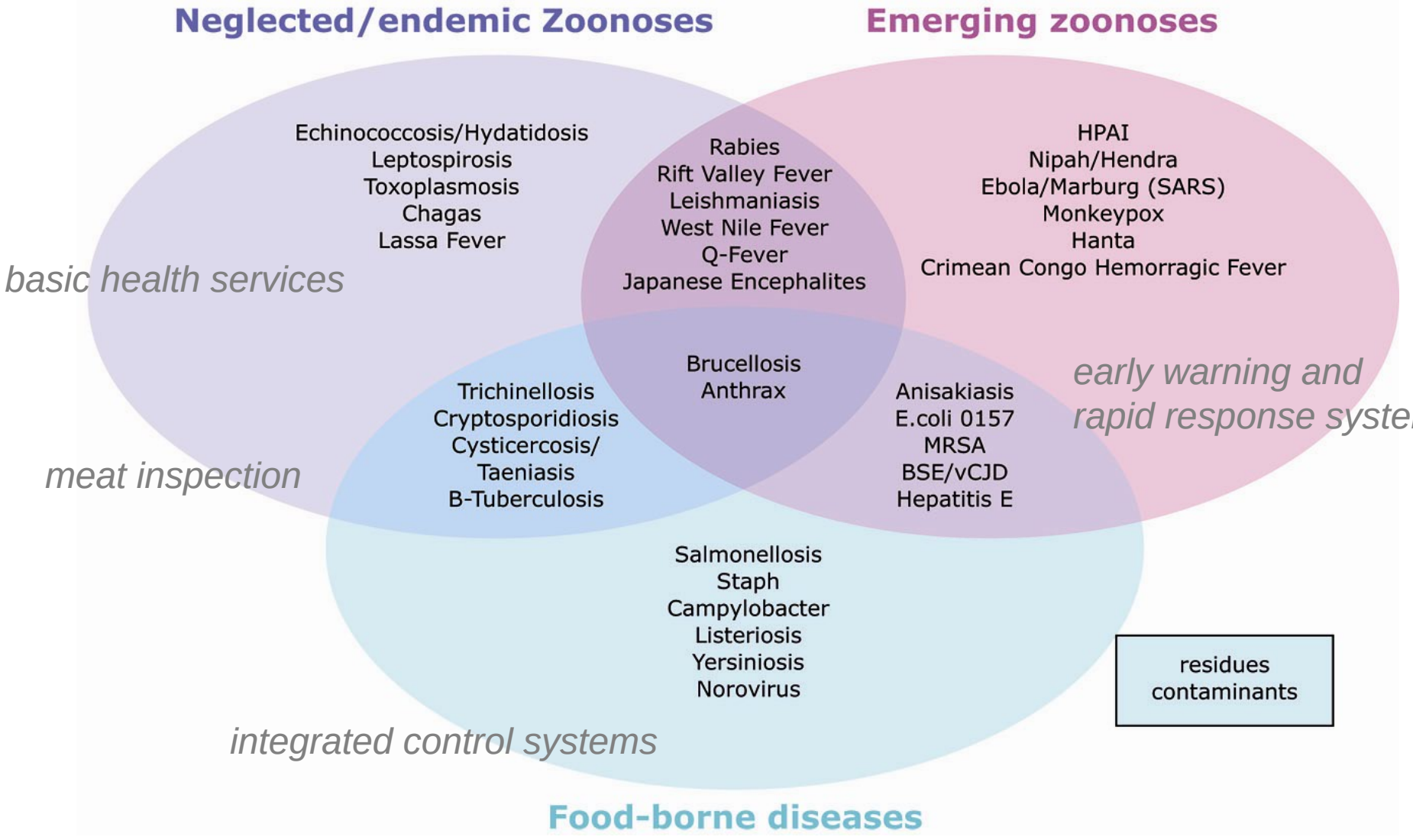
+

Emerging threats
→Tackling the root causes of emergence

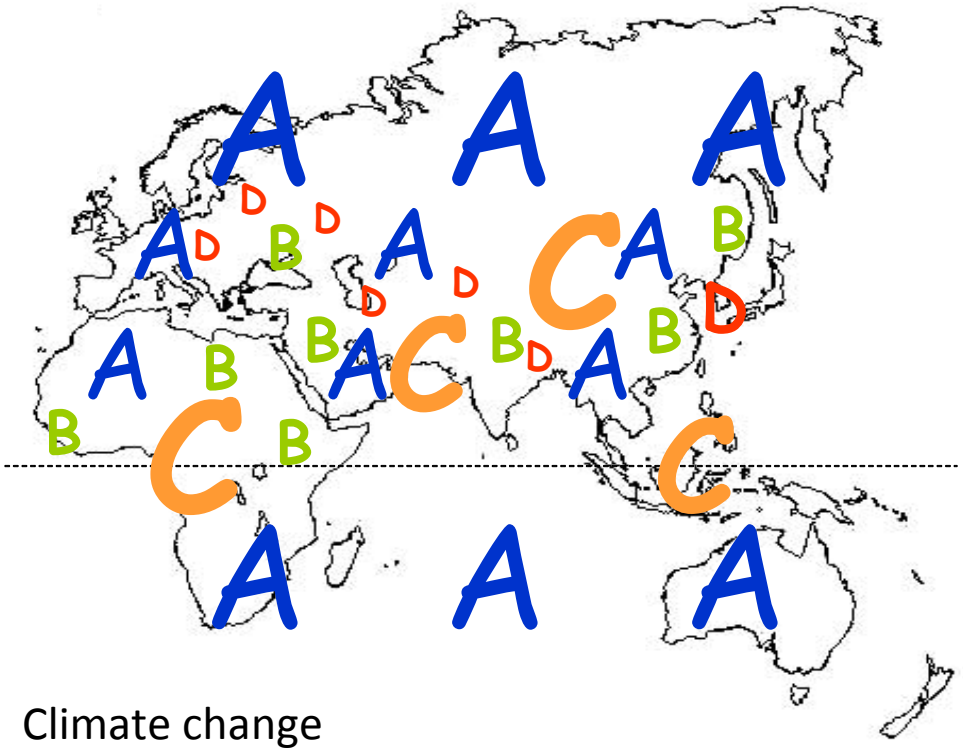


FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

FAO APPROACH TO ZOONOTIC DISEASES



Drivers of diseases moving into novel areas



AAA Climate change

BBB Land use

CCC Congregation of people and animals

DDD Globalisation – trade and traffic agric products

J.Slingenbergh (FAO)

National Animal Health Systems

- **state veterinary services**
- ***private veterinarians***
- paraveterinarians
- **community animal health workers (CAHWs)**
- laboratories
- input and technology suppliers
- licensing authorities
- professional bodies
- and the laws and regulations that bind them
- **financial and material resources**
- veterinary education
- **surveillance systems**
- diagnostic capabilities
- **response capacity**
- inspection capabilities

Early warning at community level

- basic health services
- public awareness
- participatory disease surveillance and response (PDSR)
- field epidemiology training (outbreak investigation)
- private veterinarians and GPs
- animal welfare clinics?

TRUST

Early warning at national level

- information flow
- sample collection and transportation
- diagnostic capabilities
- research institutions
- legislative framework
- **adequate response mechanisms**
- compensation

picture by Hermann Unger

Building early warning AND response systems

- syndrome/risk based surveillance
- animal and human health integrated surveillance
- interministerial task forces
- contingency plans, SOPs
- simulation exercises

Where to go?

- from early warning to rapid response
- from reactive response to proactive prevention
- One World - One Health or Many Worlds - One Health?

need for global cooperation →
investing in One Health is the way forward

Thank you!

World Rabies Day
28 September 2010

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