



West Nile Virus infection outbreaks at the European level

Annick Lenglet

Preparedness and Response Unit, ECDC

EpiSouth 3rd Training Module, Madrid, June 15, 2009

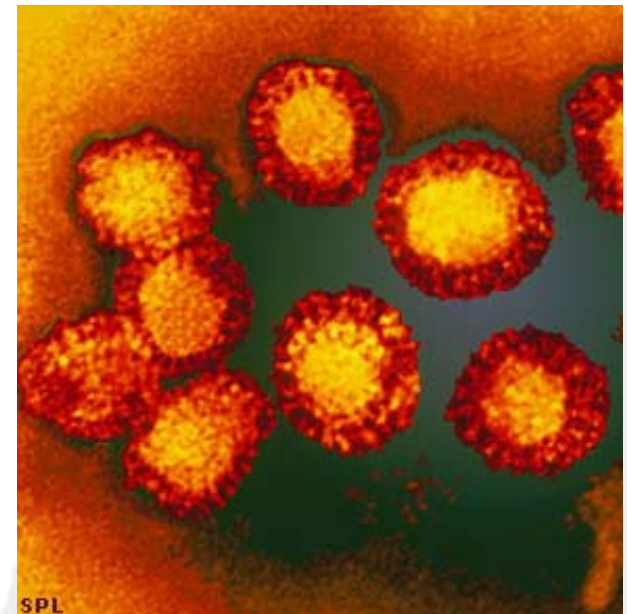
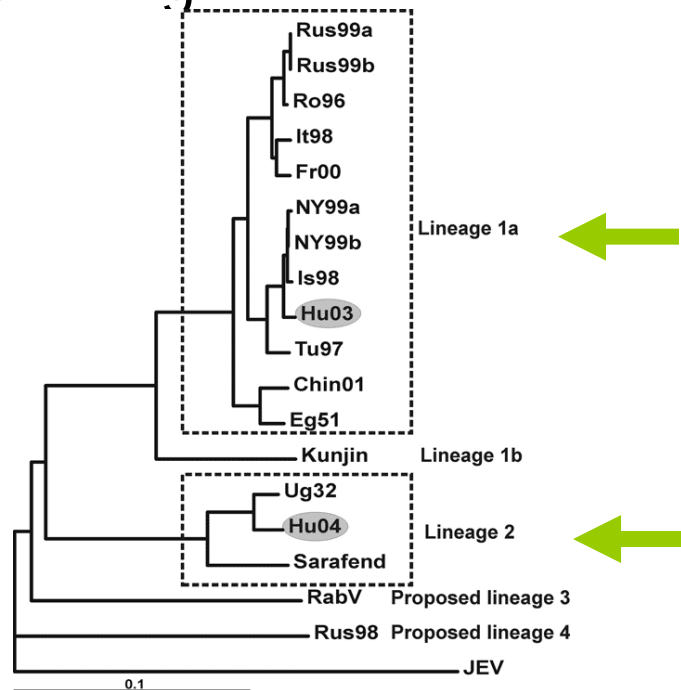
Overview

- The virus
- The epidemiology
 - Situation in Europe
- Challenges for outbreak management:
 - Surveillance
 - Blood and tissue safety
 - Coordination



West Nile virus

- Family Flaviviridae, Genus *Flavivirus*
- Enveloped single stranded positive RNA
- Different lineages



Bakonyi T et al EID 2006 April

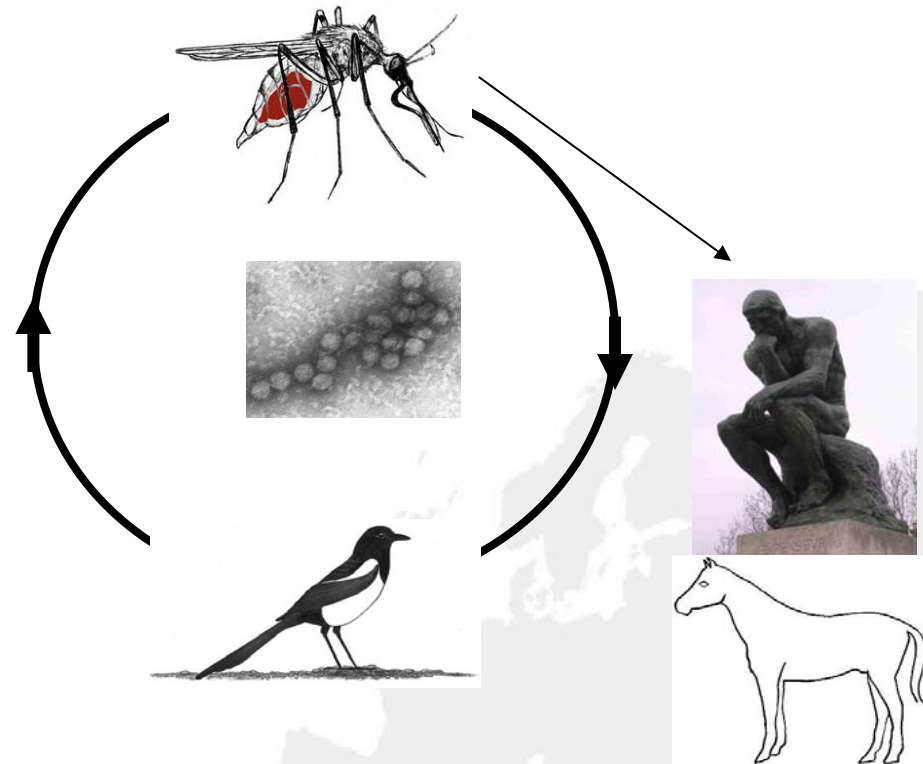
West Nile fever

History

- 1937 - first identified in Uganda
- 1950s – first recorded epidemics in Israel

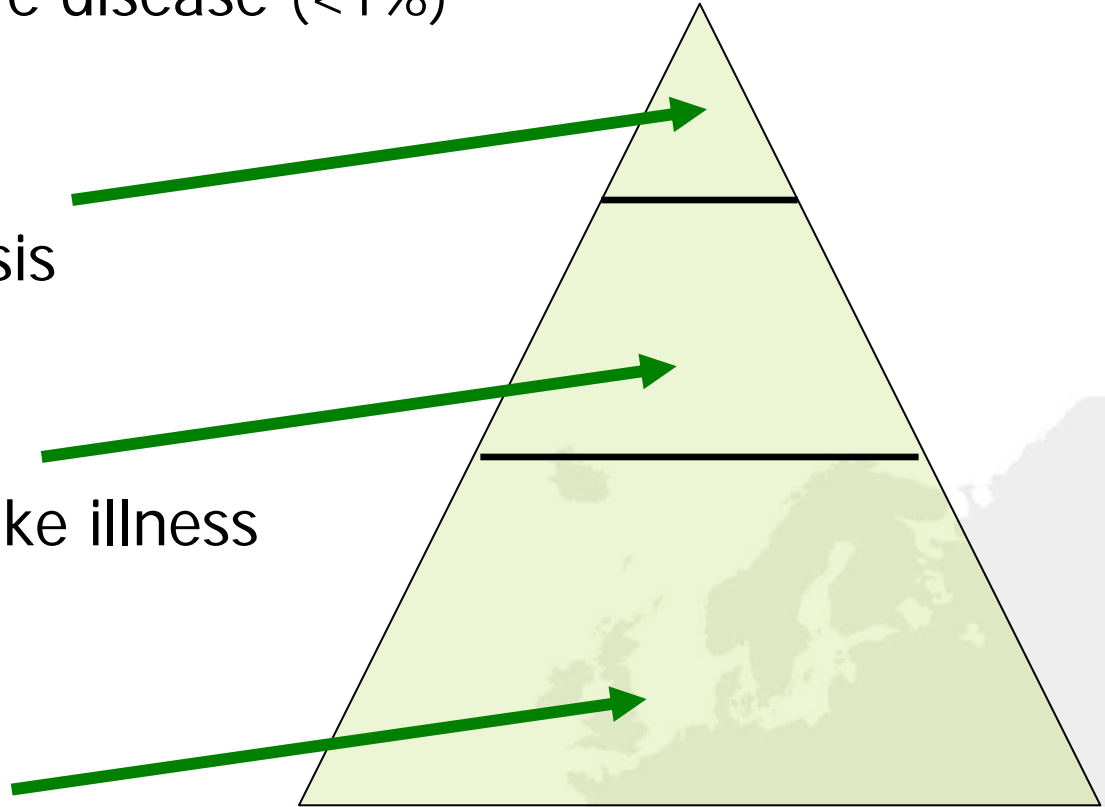
Transmission cycle

- Vector-borne disease
- Natural cycle between birds and mosquitoes
- Asymptomatic infections
- Sporadic disease outbreaks in humans and horses in Africa, Europe, Asia and Australia



Three clinical categories of West Nile virus infection

- West Nile neuro-invasive disease (<1%)
 - Encephalitis
 - Aseptic meningitis
 - Acute flaccid paralysis
- West Nile fever (~20%)
 - “benign” influenza-like illness
- Asymptomatic (~80%)



Epidemiological situation in North America

Canada 2007: 217 neuro-invasive cases 12 deaths
2008: 5 neuro-invasive cases

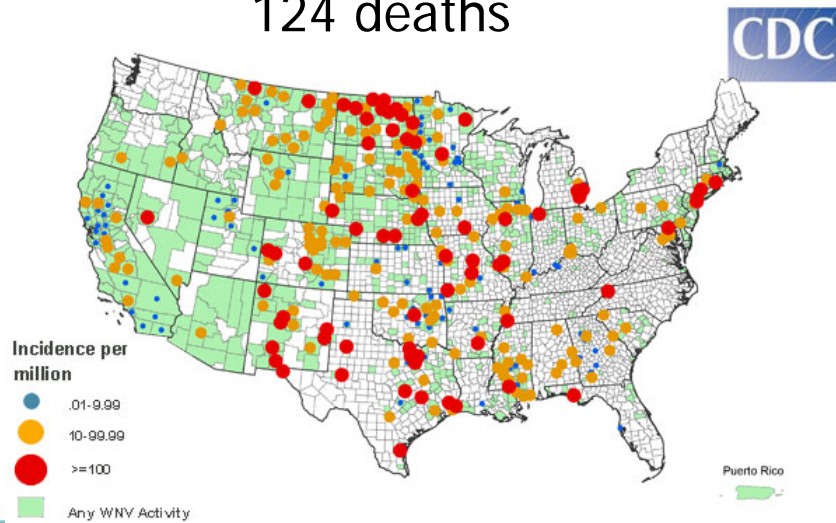
Since 1999 in the USA:

More than 11,000 neuro-invasive illness cases (1092 deaths)

2007

1217 neuro-invasive cases

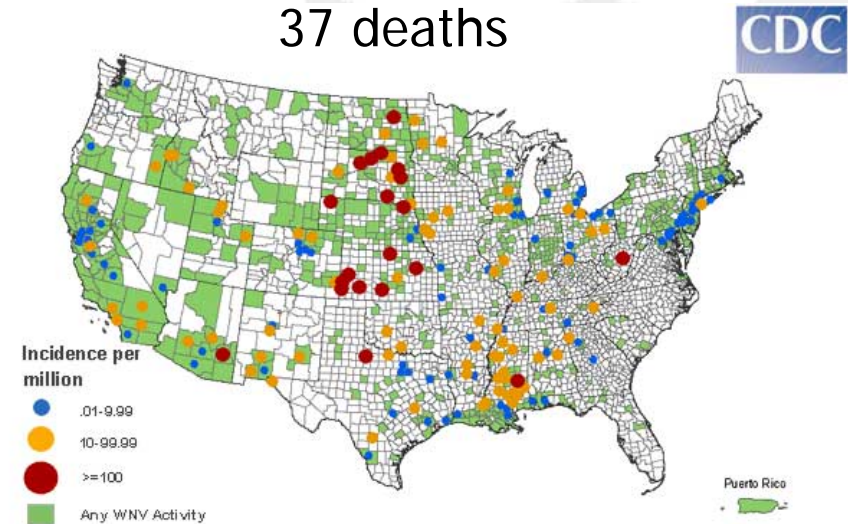
124 deaths



2008

640 neuro-invasive cases

37 deaths



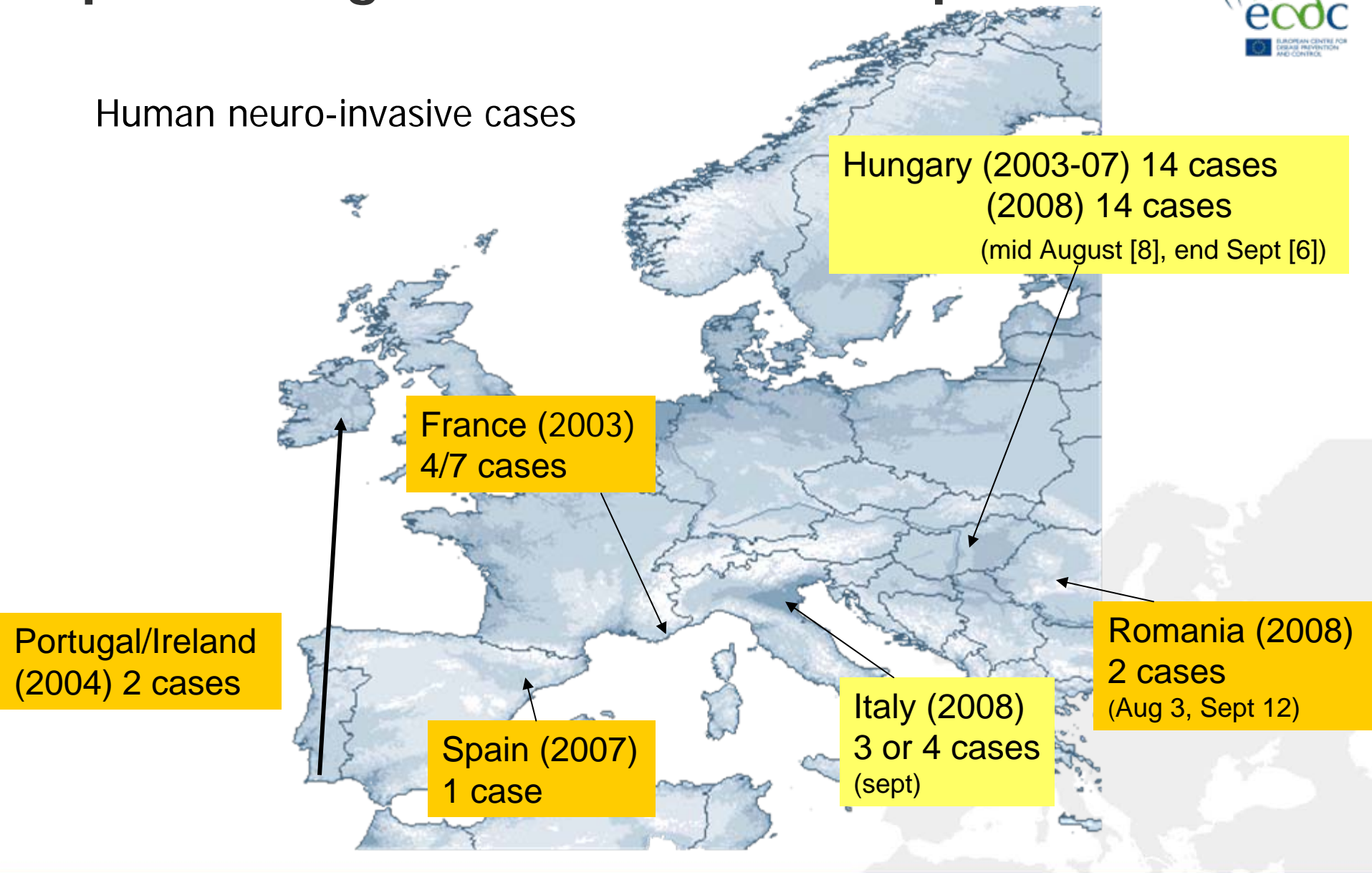
WNV outbreak in Europe and North Africa



Year	Months	Country	Group	Cases	Deaths
1994	Aug.- Sep.	Algeria	Human	50	2
1996	Aug-Oct	Morocco	Eq & Hu	94/1	42/1
	Jul-Oct	Romania	Human	393	17
1997	Sep-Nov	Tunisia	Human	173	8
1998	Aug-Sep	Italy	Human	14	6
1999	Jul-Sep	Russia	Human	318	40
	Aug	Israel	Human	2	2
2000	Aug-Oct	France	Equine	76	21
	Aug-Oct	Israel	Eq & Hu	76/417	35 Hu
	n/a	Russia	Human	32	3
2001	n/a	Israel	Human	41	2
2002	n/a	Israel	Human	26	2

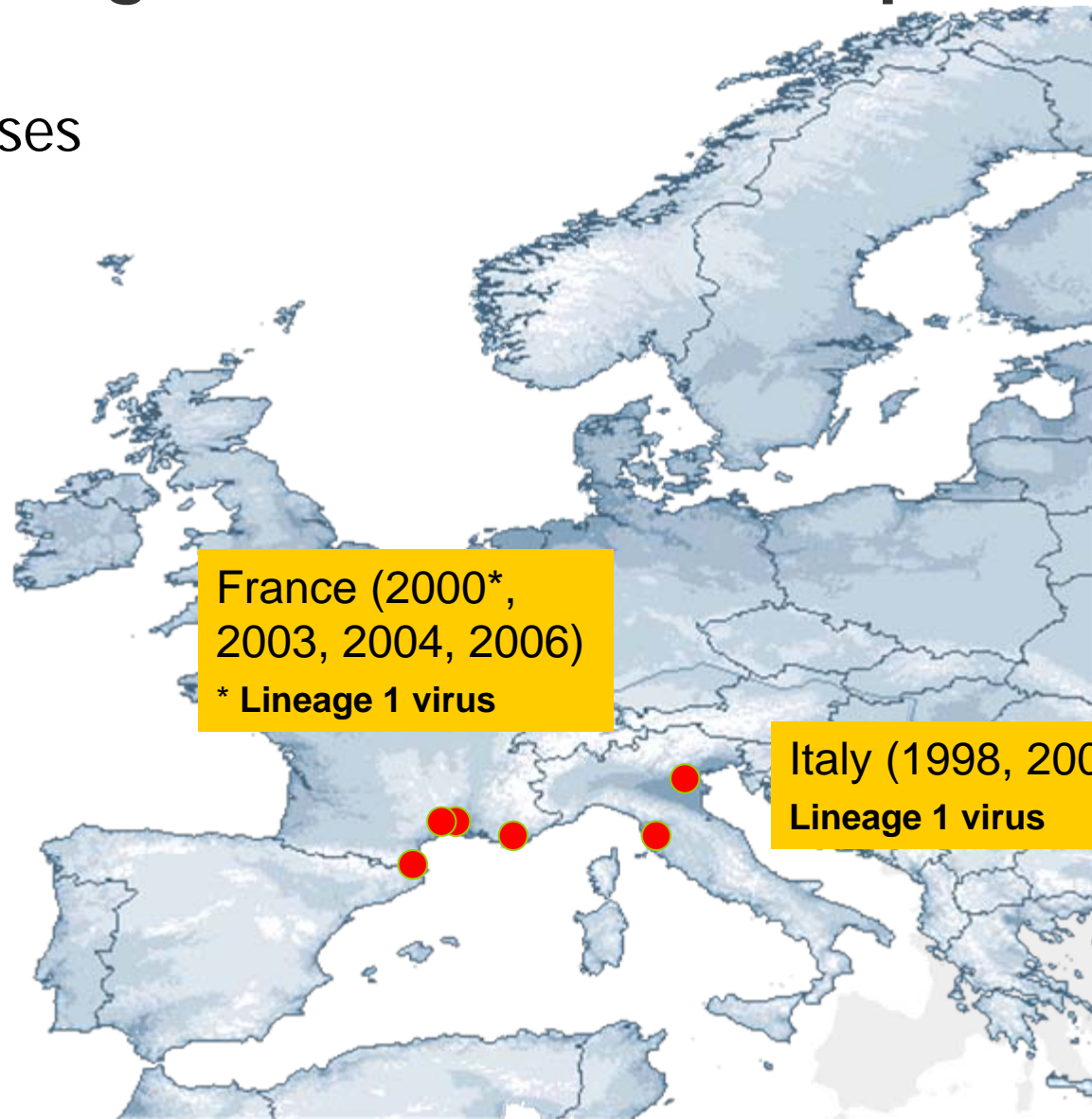
Epidemiological situation in Europe

Human neuro-invasive cases



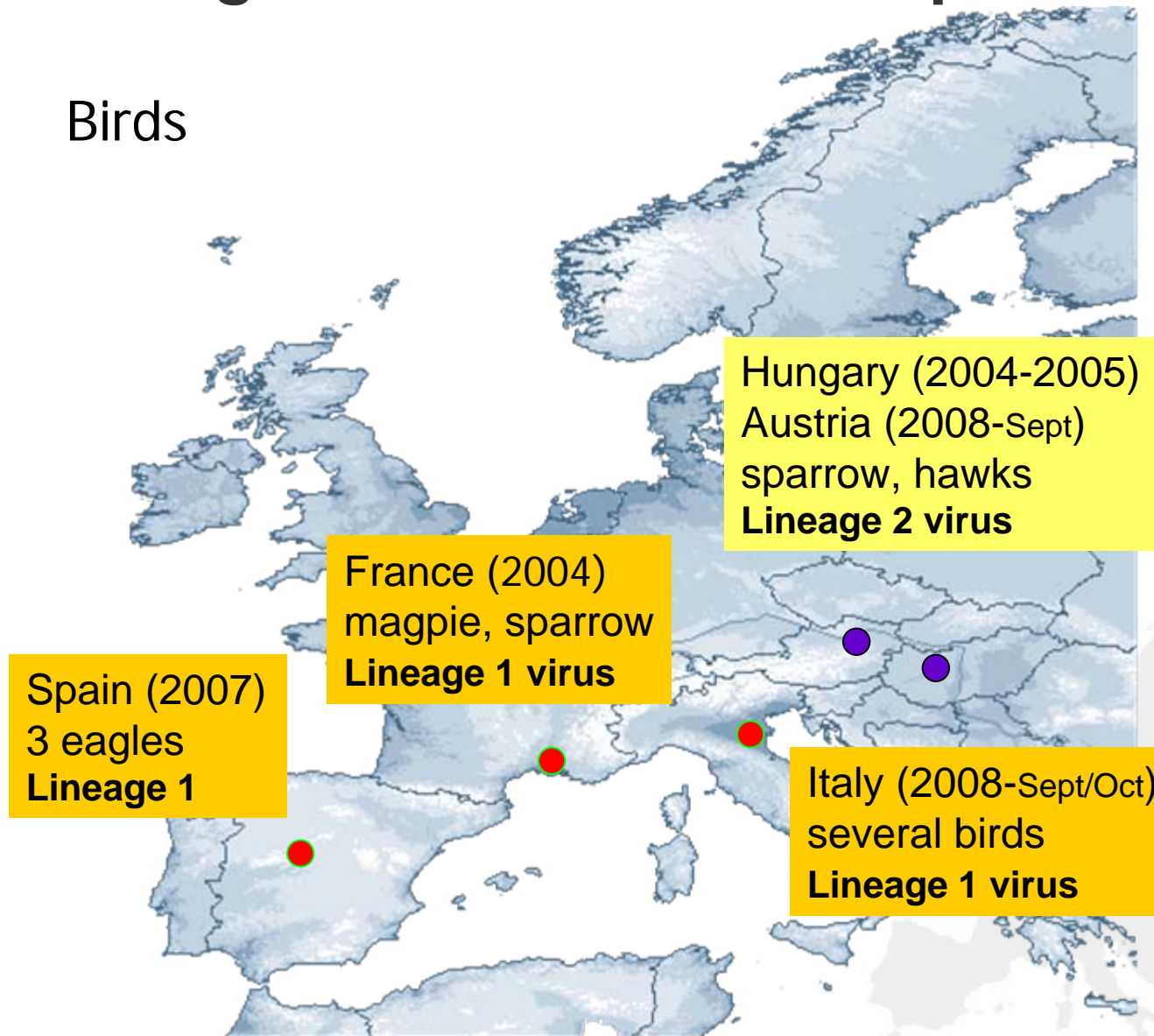
Epidemiological situation in Europe

Horses



Epidemiological situation in Europe

Birds



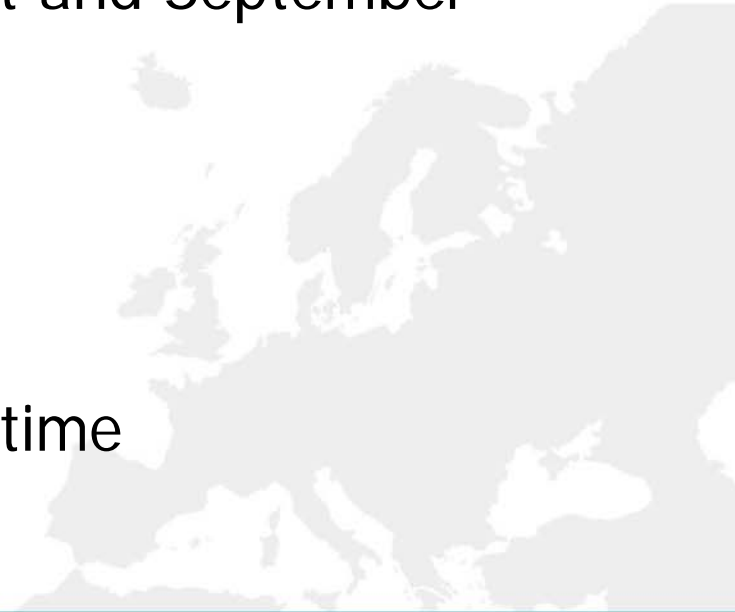
West Nile Virus infection – Europe 2008

Neuroinvasive disease

- Hungary
 - 19 cases reported throughout the country
 - Due to Lineage 2 WNV

- Romania
 - 2 cases confirmed between August and September
 - 1 case was a resident in Budapest

- Italy
 - 6 human cases confirmed
 - Large outbreak in horses at same time



Human Surveillance at the European level

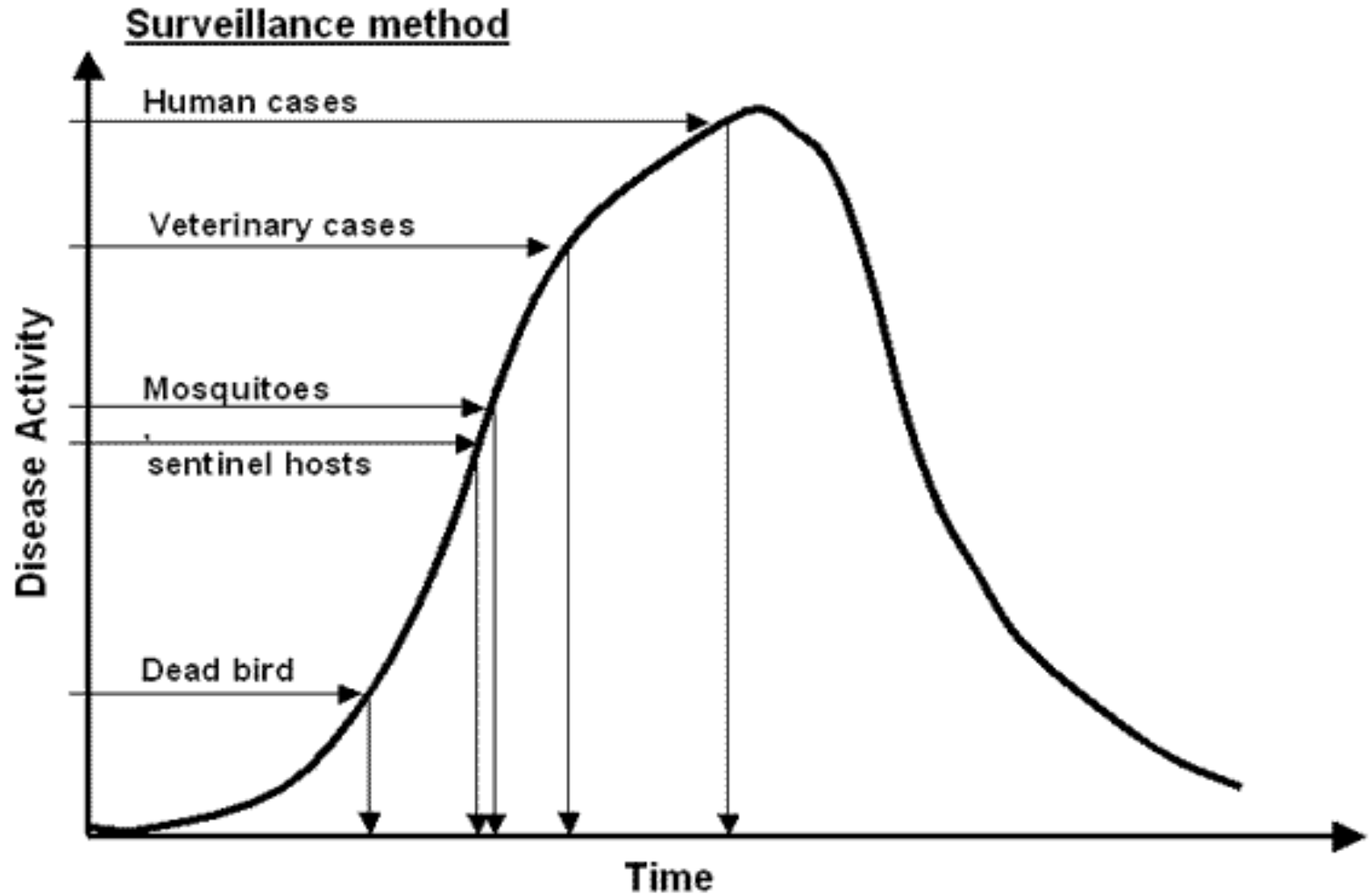


- Since 2002 – all events of public health importance within the EU should be communicated through: “Early Warning and Response System” (EWRS)

- Since 2008 – standardized case definition for WNV infection, focused on neuroinvasive disease

- Challenges:
 - Clinician awareness not high – especially in ‘new’ areas of WNV transmission
 - Laboratory capacity highly variable throughout EU
 - Underreporting at sub-national and national level
 - Underreporting and delays at EU level

But... not only human surveillance...



Challenges in other surveillance needs

■ Mosquitoes

- Limited entomologists
- Not useful for 'early warning'
- Low yield of infected pools of mosquitoes
- Necessary to assess risk of affected areas

■ Birds

- Active surveillance for sick birds is expensive and labour intensive
- Bird mortality surveillance:
 - Easier to implement
 - Can be combined with other disease surveillance programmes (eg. H5N1)

■ Equine

- Good sentinel for human infection
- Diagnosed horses are notifiable at the EU level



Other implications at EU level

- Any infectious disease outbreak that may impact on blood and tissue safety:
 - Member state should inform Commission of measures implemented to ensure safety

- Specifically for West Nile fever:
 - Blood deferral from any person who has visited an affected area for 28 days

- Therefore in ongoing outbreak, blood donations should be deferred from the whole 'affected area'
 - What is the impact on blood supplies
 - Can loss in blood supplies be offset by screening or other methods?

WNV preparedness at National level



■ Coordination

- National stakeholders: human public health, veterinary public health, entomologists, bird specialists, blood authorities, blood recipients, residents in affected area
- European stakeholders: EFSA, ECDC, SANCO C3, SANCO C6 etc.

■ Establish working groups:

- At National level
- At local level – where outbreaks occur

■ Regular and timely exchange of information:

- Local
- National
- International level



Assessing the risk for humans

- Which stakeholders should be included?
- Which surveillance data will trigger which response?
 - Infected mosquitoes
 - Dead bird diagnosed with WNV infection
 - Sick or dead horse
 - Human cases of WN fever or neuroinvasive disease
- Which geographical area can we call 'affected'?
- What is impact of control measures:
 - Increasing clinician awareness
 - Improving diagnostic capacity
 - Vector control
 - Blood and tissue deferrals
 - Blood screening
 - Raising public awareness



Conclusion



- WNV infection still has limited public health impact in Europe
- Unsure whether epidemiologically will be similar to the situation in North America in the near future
- Preparedness and outbreak response require:
 - Multisectoral approach
 - Strong central coordination at national and local level
 - At EU level:
 - coordination with scientific agencies for scientific advice and risk assessment
 - Coordination with EC for control measures and risk management

