

Public health impact of West Nile virus outbreaks in Europe in 2010

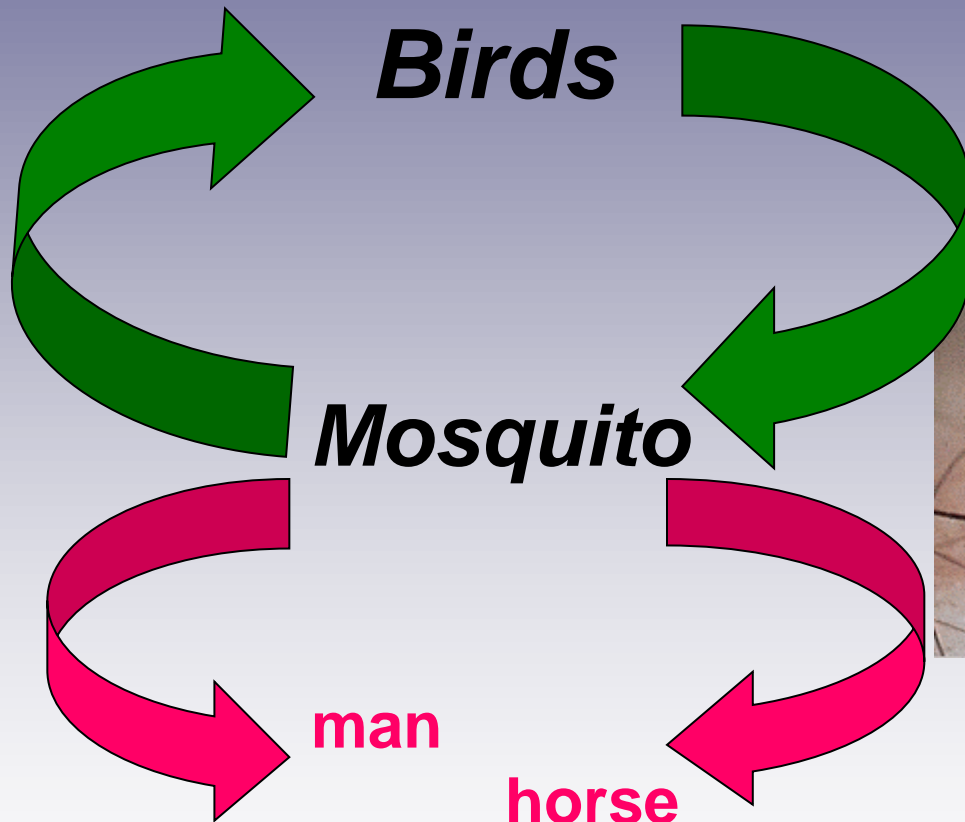
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WNV circulation in natural foci



The Vector



- Primarily bird-feeding mosquitoes (especially *Culex* spp., but WNV was isolated from c. 45 spp. worldwide)
- An estimated $\leq 1\%$ of mosquitoes in endemic areas infected with WNV

The Host



- Birds: WNV found in >160 species
 - Corvids (crows, jays, magpies) have high mortality (>90%) in North America
 - Some other bird species found to have high, long-term viraemia; many are asymptomatic
- Mammals infrequently
- Humans are dead-end hosts
- Amphibia and wetland reptiles ?

WNV transmission to human

- **Infectious mosquito bites**

Less frequent modes:

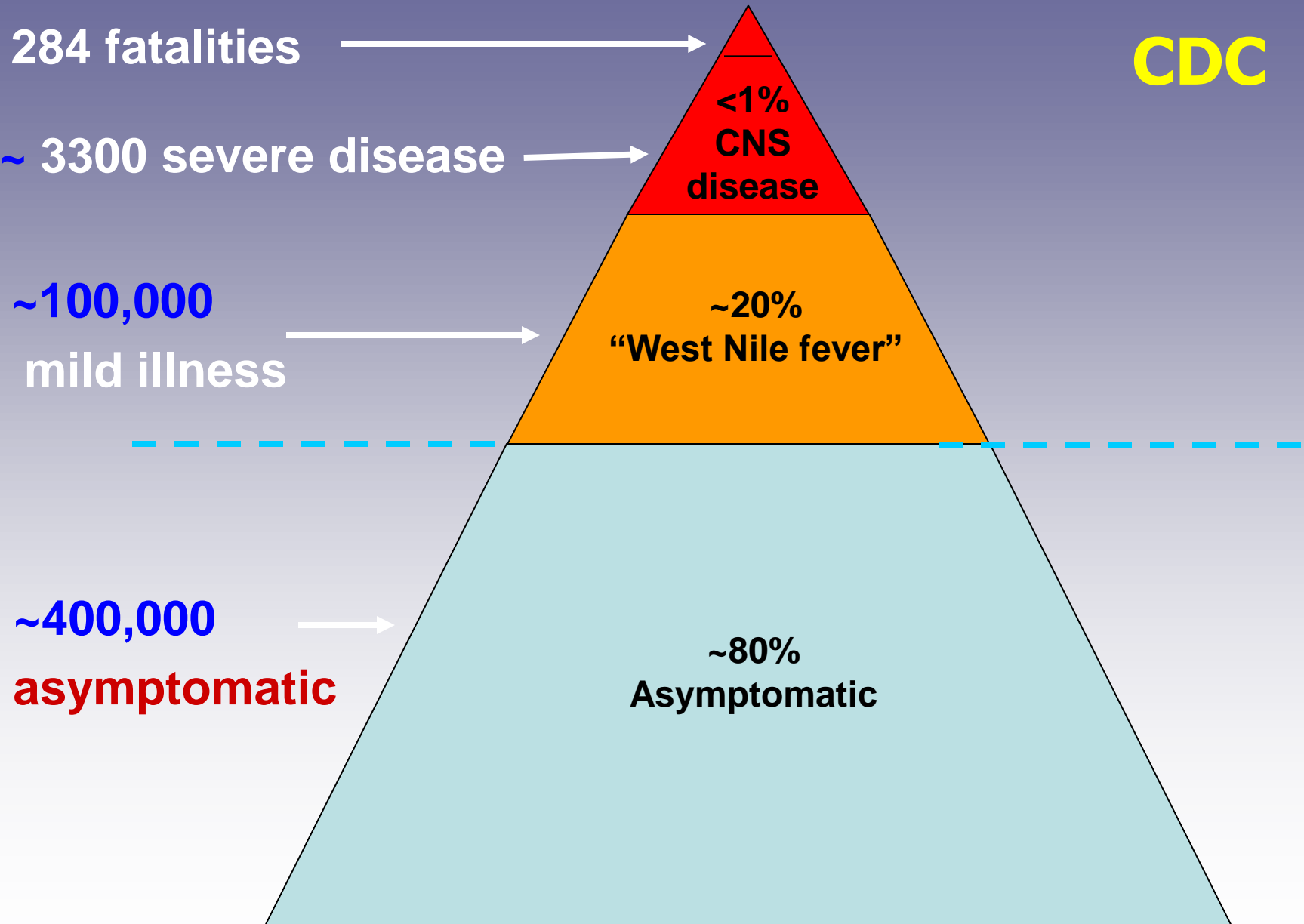
- **Blood transfusion** (USA: 23 cases 2002; 2003: 1,033/6,200,000 i.e. 0.02% of donor blood samples contained WNV)
- **Organ and tissue transplantations** (several cases)
- **Intrauterine infection** (one case)
- **Breast milk** (few cases).

Human infection

The majority (c. 80-85%) of infections are asymptomatic, but:

- 1 in 6 infected will have symptoms
- 1 in 150 will develop encephalitis
- 1 in 1500 will die

WNV human infection “iceberg” in 2002



WNF symptoms in humans

- moderate to high fever
- headache, sore throat, backache, myalgia, arthralgia, fatigue
- anorexia, nausea (vomiting)
- rash, lymphadenopathy
- acute aseptic meningitis or encephalitis
(most fatal cases >60 years old)
- less often myocarditis, pancreatitis, hepatitis

Symptoms of WN encephalitis

- severe headache, high fever, neck stiffness, vomiting, disorientation, muscle weakness, ataxia, optic neuritis, seizures, coma and in some cases death
- other CNS symptoms identified in 2002 (U.S.A.):
 - poliomyelitis-like syndrome
 - movement disorders
 - muscle degeneration (flaccid paralysis)

Sequelae

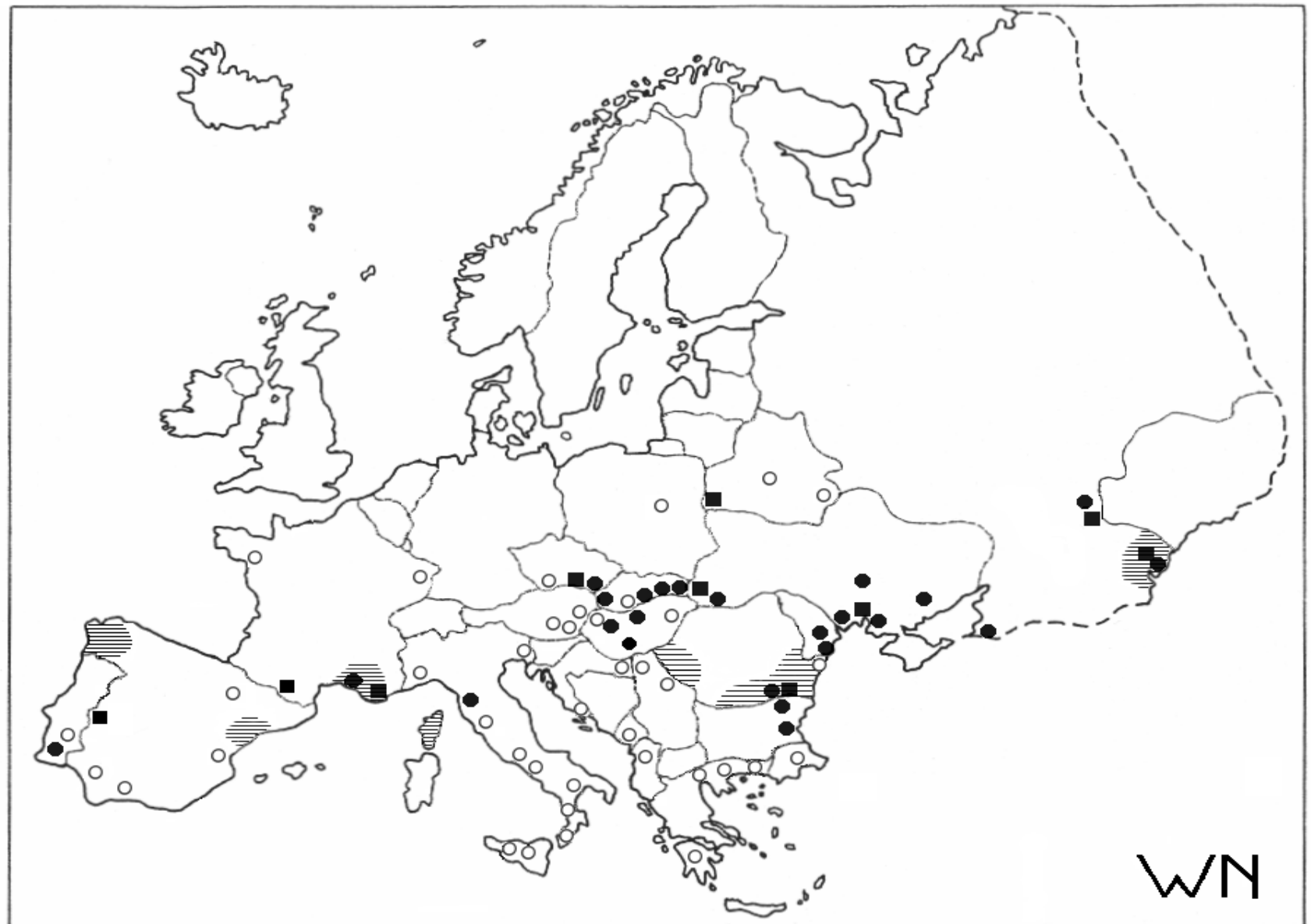
In some patients (after neuroinvasive form of the disease): pareses, great fatigue, headaches; psychotic problems (confusion, depression, decreased concentration ability, worsened memory).

Clinical symptoms in horses

Usually a neuroinvasive febrile illness:
polioencephalomyelitis with ataxia,
pareses, paralysees (up to tetraplegia)

WNV-1: ataxia and pareses usually start on
hind limbs, in WNV-2 on front limbs.

WNV distribution in Europe before 2010



An outline map of Europe is shown in the background. The map is light gray with black outlines for the continents and countries. A large white rectangular box with a black border is centered over the map, containing the main title.

WEST NILE VIRUS ACTIVITY IN EUROPE, 2010

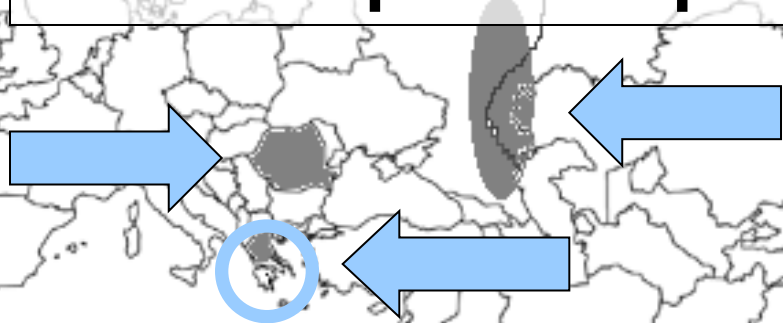
An outline map of Europe is shown in the background. A white rectangular box with a black border is centered over the map, containing the subtitle.

**VBORNET Newsletter Year 2 Issue 3,
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Flavivirus West Nile (WNV)

- 2010: activity in Europe about of the same intensity as in 2008 and 2009

- exceptional epidemiological situations in:

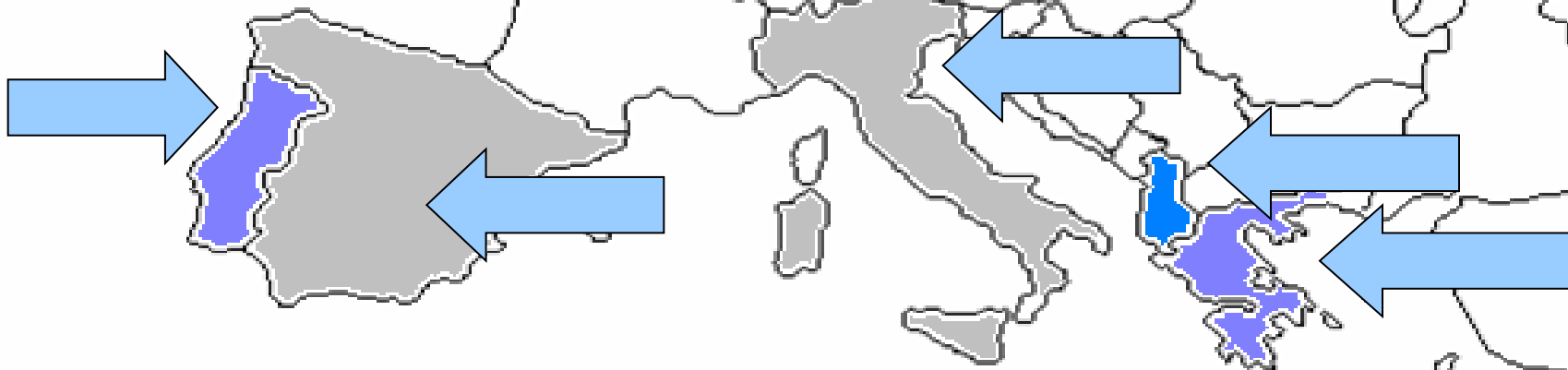


• Romania

• Greece

• southern Russia (lower Volga river)

- **Equine WND, 2010:**
Spain, Portugal, Italy, Greece, Albania



Portugal

- **1 human probable WNF case**
- July 2010
- **1 equine case in Palmela**





Spain

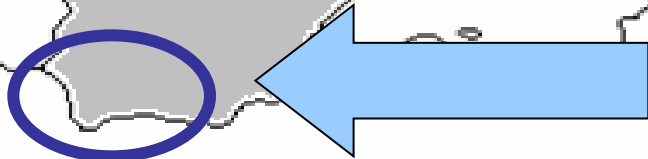
Equine cases

- in Jerez and environs, Andalusia
(provinces Cadiz, Seville and Malaga,
August to November

41 animals affected, 10 died

2 human cases

- Andalusia





Italy

- 2008 and 2009: 25 humans and 59 horses
 - Lombardy, Emilia-Romagna, and Veneto

- 2010:
 - **1 human case** occurred in Veneto, August
 - **8 equine cases** reported near Trapani, and Molise since August



Albania

- **2010: 1 equine case**

Greece

- **Central Macedonia:**
 - **261 human cases** of WNF - 34 had died, July to October
 - **7 equine cases**

RNA of WNV-2 was detected in one mosquito *Culex pipiens* (A. Papa, N. Nowotny and T. Bákonyi, pers. commun.)

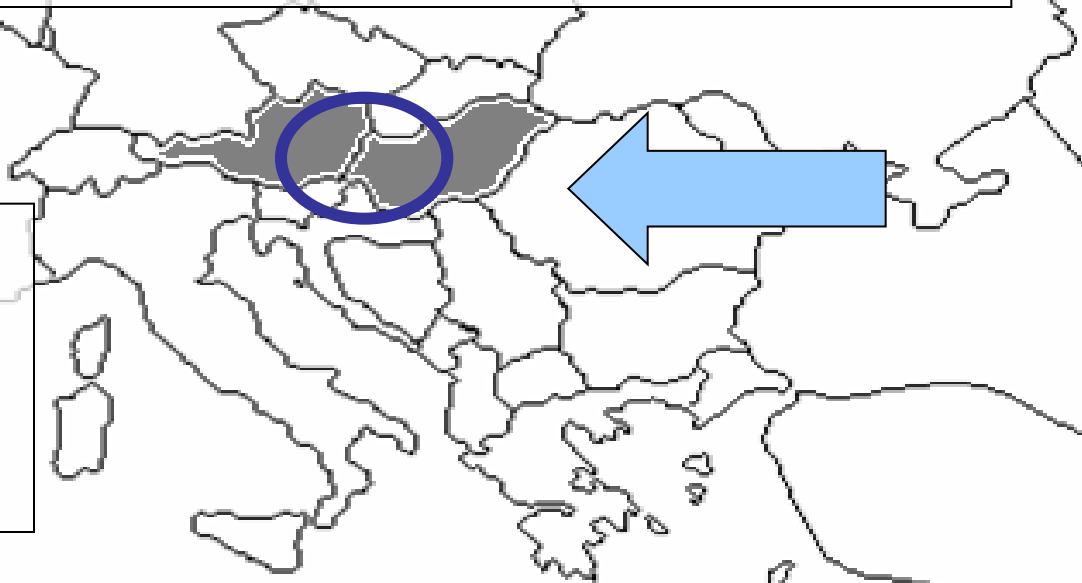


Austria and Hungary

- **2008 and 2009**

- Avian cases (eastern Austria, western Hungary): WNV lineage 2
- 18 human cases of WNF: Hungary

- **2010 Hungary**
 - **3 human cases**
(1 fatal)



Romania

- **57 human patients** with WNF, July to October
 - southern, eastern and central regions
 - **4 of them died**

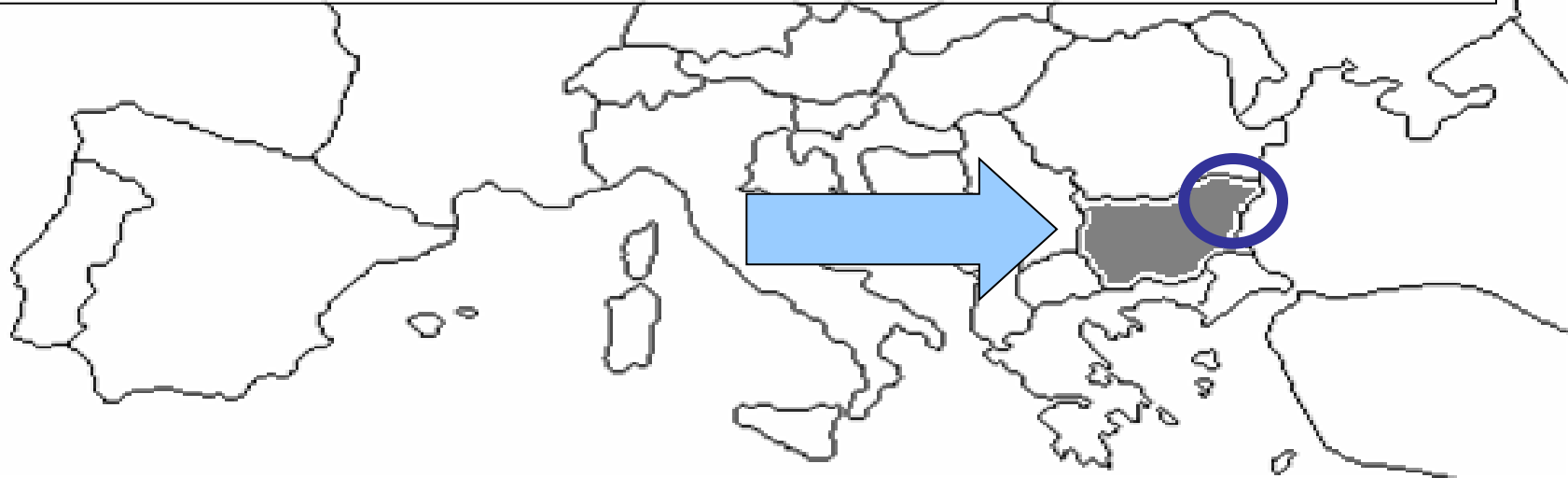
WNV lineage-2 RNA detected

= the second greatest WNF outbreak in Romania since 1996



Bulgaria

- **5 donkeys and 3 horses** - sub-clinical WNV infections - in the North-East part



Russia

A map of Russia is shown in light gray. A white box at the top contains the word "Russia". Below it, a black text box states "480 human WNF cases, 6 fatal, July to September". A blue arrow points from the left towards a blue circle on the map, which highlights the southern European part of Russia. To the right of the circle, four white boxes with black borders list case counts for specific regions: "393 in Volgograd area", "53 in Rostov area", "25 in Voronezh area", and "6 in Astrakhan". At the bottom left, another black text box says "+ individual cases in Krasnodar, Kalmykhia, and Chelyabinsk areas".

480 human WNF cases, 6 fatal, July to September

393 in Volgograd area

53 in Rostov area

25 in Voronezh area

6 in Astrakhan

+ individual cases in Krasnodar, Kalmykhia, and Chelyabinsk areas

Non-European Mediterranean area, 2010



Turkey (7 human cases; provinces Manisa, Aydin, Isparta – 3 patients died)

Israel (20 human cases), July to August
- Interestingly, two Dutch travellers were also infected with WNV in Israel in July 2010.

Equine WNF: Morocco

Total reported cases in Europe, 2010

WN disease:	Human	Equine
No. cases:	805	58
Fatal cases:	45	13
Fatality rate:	5.6%	22.4%

CONCLUSIONS

- **WND cases in Europe occurred between July and October (November) 2010**
- **The fatality rate of human WND was highest in Greece (13.0%), while low in European Russia (1.3%)**
- **Epidemiological surveillance for WND is recommendable in southern Europe**
- **Mosquito control measures in WND foci should be implemented in June**