

# WEST NILE VIRUS CIRCULATION IN THE EPISOUTH COUNTRIES AND NEIGHBOURING AREAS SEASONS 2010 AND 2011 *Update 1<sup>st</sup> July 2012*

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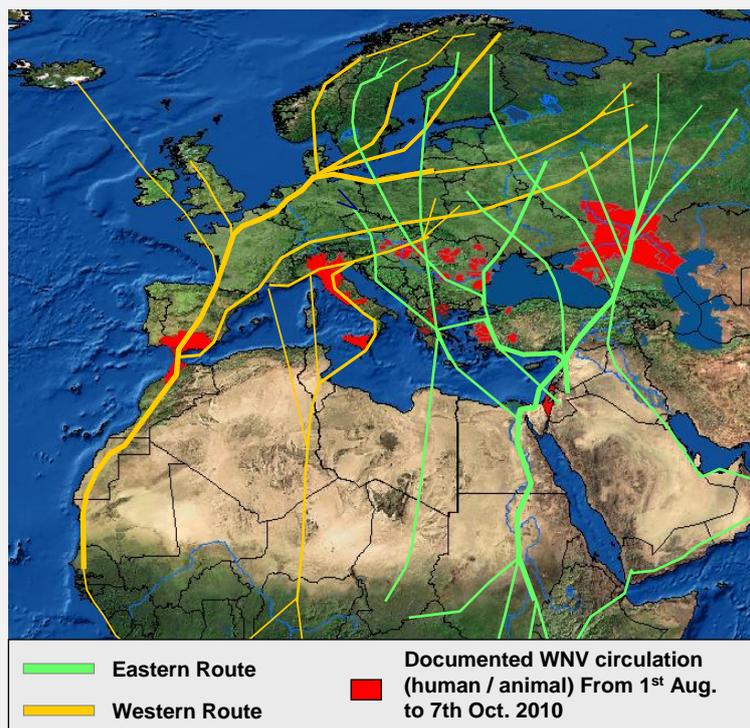
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## KEY POINTS

- ❖ Following the unprecedented West Nile Virus (WNV) outbreak in 2010 in the Mediterranean region, the close monitoring of the 2011 season was crucial to better appraise WNV circulation in the area.
- ❖ Although number of reported cases was lower, the 2011 season confirmed the unusual WNV dynamic in the Mediterranean basin observed in 2010.
- ❖ In 2010, 485 human cases were reported in 9 EpiSouth countries, 54% of these cases occurred in Greece.
- ❖ In 2011, 232 human cases were reported in 8 countries, with 43% of them in Greece.
- ❖ A limited geographical extension was reported within previously affected countries and to a new country but on a larger scale the affected regions remain comparable to the ones observed in 2010.
- ❖ During both seasons, viral circulation was more intense in the Eastern part of the Mediterranean.
- ❖ Lineage 2 was isolated in at least 3 countries of the eastern Mediterranean and one country in the West, while lineage 1 was detected in the West only.
- ❖ During both years, outbreaks were identified on all major birds' migratory routes crossing the Mediterranean region.
- ❖ Sustained transmission cannot be excluded in the coming year.
- ❖ Genetic information is too scarce to allow detailed description of the dynamic.
- ❖ Emphasis should be put on gathering biological data.

## MAP 1. MIGRATORY ROUTES IN THE MEDITERRANEAN REGION

([http://www.episouth.org/outputs/wp6/CCHF-WNV-ARBOZONET\\_NOV\\_2010.pdf](http://www.episouth.org/outputs/wp6/CCHF-WNV-ARBOZONET_NOV_2010.pdf))



## BACKGROUND

- West Nile Virus (WNV) is a flavivirus belonging to the Japanese encephalitis antigenic complex. It has been discovered in 1937 in Uganda, and its circulation has been documented in Africa, the Americas, Asia, Europe and the Middle East.
- WN is a mosquito-borne infection affecting mainly wild birds and transmitted by different mosquitoes' species mainly *Culex spp* and *Aedes spp*. Human and mammals, especially horses, are occasional hosts and play limited roles in the natural cycle.
- Several WNV subtypes have been described. Previous European and Mediterranean basin outbreaks were due to lineage 1 strains whereas lineage 2 strains circulating mainly in Sub-Saharan Africa and Madagascar were considered non-pathogenic in human and horses. Recent publications from South Africa and Russia suggest that lineage 2 strains could be more pathogenic for human and horses than initially considered.
- Humans are mainly infected through the bite of an infected mosquito but transmission through blood transfusion or organ transplants also occurs.
- The incubation period is usually 3 to 14 days. Around 80% of human infections are asymptomatic. The 20% symptomatic cases present a usually self-limited fever syndrome and less than 1% of WNV infections develops a severe form potentially lethal (i.e. meningitis, encephalitis or paralysis). Treatment is mainly symptomatic and no vaccine is available for humans (only for horses).
- Among severe cases, case fatality rate (CFR) ranges from 3 to 15 % and is higher in elderly.
- In 2010, unprecedented WN viral circulation occurred in the Mediterranean region and WNV infections were reported in 9 EpiSouth countries (cf. note on [WNV in EpiSouth countries](#), in 2010).
- Since the first documented outbreak in 1951 in Israel, outbreaks or sporadic WNV circulation has been documented in countries of the Balkans, Middle-East, North-Africa and Southern Europe. Large outbreaks affecting several hundred cases were described in Romania in 1996-1997, in Tunisia in 1997, in Southern Russia in 1999 (mainly in Volgograd, Astrakhan and Krasnodar regions) and in Israel in 2000. Up to 2010, these events remained restricted to limited geographical settings.

## DATA COLLECTION

- Data regarding numbers of human and animal cases diagnosed in 2010 and 2011, and the nature of WNV surveillance and laboratory capacities were collected from the 27 EpiSouth countries.
- On 27<sup>th</sup> January 2012, questionnaires were sent to EpiSouth focal points. Data were also consolidated with data provided by the WP4 on Laboratory

networks. Official reports issued by OIE and MoH/MoA were also considered for cases counts.

- All 27 EpiSouth countries provided information regarding their current epidemiological situation and/or their WNV Surveillance system in 2010 and/or 2011.
- This analysis aims at comparing 2010 and 2011 WNV seasons in terms of epidemiological situation (number of cases and geographic distribution) and surveillance systems. In this note, the number of reported cases corresponds to the suspect and confirmed cases, based on the national definitions (of suspect and confirmed cases).
- In the course of a known and ongoing epidemic not all cases have to be fully biologically confirmed especially those occurring in well identified endemic zones. Therefore in endemic countries biological confirmation procedures may change over time (e.g. only through serology and not through PCR or sero-neutralisation). Therefore, within all cases, the proportion of biologically confirmed and suspect cases is subject to changes. For instance in Greece in 2010, 262 human biologically confirmed cases and 2 suspect cases were reported versus 53 human confirmed cases and 48 suspect cases reported in 2011.

In this respect, both confirmed and suspect human cases were considered for the analysis when at least part of the cases was biologically confirmed. Conversely, for countries where only clinically suspect cases were detected, these suspect cases were not considered for the case count and the viral circulation among humans.

## SURVEILLANCE SYSTEMS

- 25 countries provided information on their **West Nile surveillance system**. As of 24<sup>th</sup> April 2012, the situation in 2011 was as followed:
  - ✓ **18** countries have a **human surveillance system**: 12 countries have a permanent surveillance system (in process of implementation for Bulgaria in 2011), 3 have a seasonal surveillance system and 3 have a combination of both.
  - ✓ **15** countries have an **equine surveillance system**: 9 countries maintain permanent equine surveillance system (new for Croatia and Serbia in 2011), 4 have seasonal surveillance (new for the FYR-Macedonia in 2011), and 2 have a combination of both.
  - ✓ Among the **10** countries having bird **surveillance**, 4 maintain a permanent surveillance and 4 have a seasonal surveillance, while 2 countries have a combination of permanent and seasonal surveillance (Bulgaria and Serbia).
  - ✓ **7** countries have **neither human nor equine surveillance**. To date, these countries never reported West Nile cases (cf. Table 1, Map 1).

## LABORATORY CAPACITIES

- Laboratory capacities (cf. Table 1, Map 2).
  - ✓ Among the 25 countries for which information is available, 22 have a national reference laboratory among which 19 have the capacity to diagnostic WNV cases.
  - ✓ 3 have no specific reference laboratory
- It is worth mentioning that changes in surveillance systems resulting from the strengthening of surveillance following the unprecedented 2010 outbreak, have to be taken into account when analysing the differences between the two 2010 and 2011 seasons.

## EPIDEMIOLOGICAL SITUATION

### Overview

- Of the 27 EpiSouth countries:
  - ✓ In **2010**, 11 countries reported WNV circulation in human and/or equine (cf. map 3).
  - ✓ In **2011**, 9 EpiSouth countries have reported WNV circulation in human and/or equine (cf. map 4).

### In humans:

According to data reported by EpiSouth countries:

- In **2010**, 485 human WN infections were reported in 9 countries: Albania, Greece, Israel, Italy, Palestine, Romania, Spain, Tunisia & Turkey. For Albania, Greece and Turkey, these clinical WN human cases were the first ever reported in the countries.
- In **2011**, 232 human WN infections were reported in 8 countries: Albania, Greece, Israel, Italy, Former Yugoslav Republic of Macedonia (FYR-Macedonia), Romania, Tunisia & Turkey. For FYR-Macedonia these cases were the first reported in the country. Note for Albania, the child affected in 2010 was retrospectively notified in 2011.
- There were approximately 50% less WN human infections in 2011 compared to 2010.
- 2 countries affected in 2010 (Spain and Palestine) did not report any WNV infections in human in 2011.

### In equine:

- In 2010, 8 countries reported equine WN cases: Bulgaria, Greece, Israel, Italy, Morocco, Romania, Spain and Turkey.
- In 2011, only 4 countries reported equine WN cases: Greece, Israel, Italy and Spain.
- Half of the countries reporting equine cases in 2010 were reporting cases in 2011.
- In 2010, Morocco and Bulgaria reported equine cases only (no human cases), same for Spain in 2011.

## Lineage

- Understanding the genetic relations between the viruses circulating across the area would be essential to better understand the dynamic of the viral circulation in the Mediterranean area. Unfortunately, lineage and molecular analysis are delicate techniques requiring genetic sequencing that are not widely available.
- Therefore genetic information allowing describing viral circulation in 2010-2011 is very scarce. Based on data available in countries strains both lineage 1 and lineage 2 have been identified :
  - ✓ **Lineage 2** strain was isolated in:
    - Italy, from mosquitoes<sup>1</sup> and humans in 2011<sup>2</sup>
    - Greece, from a human<sup>3</sup> & mosquitoes<sup>4,5,6</sup> in 2010
    - Romania, from human both in 2010 & 2011
    - Albania, in human in 2011.
    - Strains for which information was available were either related to the 2007 Volgograd strain or the Hungarian strain isolated from birds in 2004<sup>7</sup>.
  - ✓ **Lineage 1** strain was isolated in:
    - Italy, from humans in 2010 and 2011
    - Spain, from 2 human cases in 2010.

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**TABLE 1. WNV SURVEILLANCE IN HUMAN AND EQUINE, IN EPISOUTH COUNTRIES**

	Countries	WNV surveillance		National Reference laboratory	WNV diagnostic available
		In Human	In Equine		
1	Albania	-	-	Yes	-
2	Algeria	No	No	Yes	-
3	Bosnia-Herzegovina	No	No	Yes	No
4	Bulgaria	permanent (2011 )	Permanent	Yes	yes
5	Croatia	Permanent	Permanent (2011)	Yes	yes
6	Cyprus	Permanent	Permanent	Yes	yes
7	Egypt	-	-	-	-
8	France	Permanent + seasonally enhanced	Permanent	Yes	Yes
9	Greece	Permanent	Permanent	Yes	yes
10	Israel	Permanent	Permanent	Yes	Yes
11	Italy	Seasonal	Seasonal	Yes	Yes
12	Jordan	Permanent	Seasonal	Yes	yes
13	Kosovo	Permanent	No	No	yes
14	Lebanon	No	No	-	-
15	Libya	Permanent	No	Yes	Yes
16	Macedonia	Permanent	Seasonal (2011)	Yes	yes
17	Malta	No	No	No	No
18	Montenegro	No	No	Yes	No
19	Morocco	Permanent	Permanent	Yes	Yes
20	Palestine	Permanent + seasonally enhanced	Seasonal	Yes	Yes
21	Romania	Seasonal	Permanent + seasonal	Yes	Yes
22	Serbia	Seasonal	Permanent (2011) + seasonal	Yes	yes
23	Slovenia	No	no	Yes	Yes
24	Spain	Permanent (spec. areas)	Permanent (spec. areas)	Yes	Yes
25	Syria	No	No	No	No
26	Tunisia	Permanent + seasonally enhanced	no	Yes	Yes
27	Turkey	permanent	Permanent	Yes	Yes

‘-’ missing data

**TABLE 2. NUMBER OF HUMAN AND EQUINE CASES BY COUNTRIES**

	Countries	N Confirmed and suspect Human cases (death)		N Confirmed an suspect Equine cases	
		2010	2011	2010	2011
1	Albania	1	49	0	0
2	Algeria	0	0	0	0
3	Bosnia-Herzegovina	0	0	0	0
4	Bulgaria	0	0	8	0
5	Croatia	0	0	0	0
6	Cyprus	0	0	0	0
7	Egypt	0	0	0	0
8	France	0	0	0	0
9	Greece	262 (35)	101 (9)	30	24
10	Israel	109 (4)	45 (3)	8	11
11	Italy	3	14 (4)	128	197
12	Jordan	0	0	0	0
13	Kosovo	0	0	0	0
14	Lebanon	0	0	0	0
15	Libya	0	0	0	0
16	Macedonia	0	4	0	10
17	Malta	0	0	0	0
18	Montenegro	0	NA	0	NA
19	Morocco	0	0	24	0
20	Palestine	1	0	0	0
21	Romania	57 (5)	11(1)	6	0
22	Serbia	0	0	0	0
23	Slovenia	0	0	0	0
24	Spain	2	0	16	11
25	Syria	0	0	0	0
26	Tunisia	3 (0)	3	0	0
27	Turkey	47 (10)	5	2	0
	<b>TOTAL</b>	<b>485 (38)</b>	<b>232 (17)</b>	<b>222</b>	<b>253</b>

NA : not applicable

## Countries Data

### South Europe

#### Bulgaria:

- **WNV Surveillance**

- Since July 2011, a system of surveillance of WNV infection in human has been implemented. So far only infections in birds and equines were under surveillance.

- **Human cases**

- No biologically confirmed WNV human infections were reported in 2010 and in 2011.
- In 2011 one possible human case was reported but it could not be laboratory confirmed (seroneutralisation is not available in Bulgaria).

- **Equine cases**

- In **2010**, 8 cases (in donkeys) were notified: 5 in Dobrich province (North-East of the country, near Romania and Black Sea) and 3 in Varna oblast (close to Dobrich).
- In 2010, a seroprevalence survey based on 118 horses found 8 positive cases.

#### Italy:

- **WNV Surveillance**

- WNV surveillance for humans, equine and birds is implemented in Italy.

- **Overall circulation**

- In **2010**, 6 provinces reported WNV circulation (in humans, horses and birds).
- In **2011**, 15 provinces reported WNV circulation.

- **Human cases**

- In **2010**, 3 WNV human cases were reported in Veneto region.
- In **2011**, 14 WNV human cases were reported in 6 provinces (Belluno, Venezia, Treviso, Olbia, Oristano, Udine).

- **Equine cases**

- In 2010, 128 cases were reported in 5 provinces.
- In 2011, 197 cases were reported in 13 provinces.

#### Lineage

- In 2010 and 2011 lineage 1 was detected in humans in Italy. In 2011, lineage 2 was found in mosquitoes and in humans (but with no evidence of neuroinvasive disease).

## Greece:

- **WNV Surveillance**
  - Human surveillance for WNV is implemented in Greece.
  - Following the 2010 outbreak, surveillance in equine and birds has been strengthened.
- **Human cases**
  - Before 2010, a sero-prevalence survey in human population found that 1% of the sample was positive for WNV.
  - In 2010, 262 human infections were diagnosed for the first time in Greece. Cases were reported in 10 prefectures.
  - In 2011, 101 WN human infections were reported in 14 prefectures (one case was imported from Albania).
- **Equine cases**
  - In 2010, 30 confirmed equine cases were reported in 6 prefectures.
  - In 2011, 24 confirmed equine cases were reported in 6 prefectures.
- **Lineage**
  - In 2010 lineage 2 WNV strain was detected in *Culex pipiens* mosquitoes collected in 2 locations where WNV cases were reported and in a [blood donor](#) residing in the same area. WNV lineage 2 sequences from strains isolated from human and mosquitoes were identical and show high genetic identity to a Hungarian WNV strain isolated from birds in 2004.
  - In 2011 also Lineage 2 WNV was identified both in mosquitoes and humans.

## France:

- **WNV Surveillance**
  - WNV surveillance for humans, equine and birds is implemented in France.
- **Human cases**
  - The last autochthonous human WN cases were reported in 2003 (no cases in 2010 and 2011).
- **Equine cases**
  - The last equine cases were detected in 2006.

## Malta:

- **WNV Surveillance**
  - There is no specific WNV surveillance system implemented in Malta.
  - The country has just been recently equipped with kits to detect WNV viral antigen with PCR.
- **Human and equine cases**
  - No human or equine cases have been reported in Malta in 2010 and 2011.

## Romania:

- **WNV Surveillance**
  - WNV surveillance for humans and equine is implemented in Romania.
- **Human cases**
  - In 2010, 57 human WN cases were reported. Most cases (n=35, 61%) were reported in known endemic areas (southern part of the country). WNV cases have also been reported in areas which were so far unaffected such as in the

Central Transylvania and in the Moldavian plateau.

- In 2011 season, 11 WN human cases were recorded; most of them (n=6, 54%) in Bucharest city. The other cases were recorded in known endemic areas: Constanta (2 cases), Galati (1 case) and Tulcea (1 case). One WN human case was recorded in a newly affected area in 2010, Iasi district (Moldavian plateau).
- **Equine cases**
  - In 2010, 6 equine cases were reported in Braila and Constanta areas.
  - In 2011, no equine case has been reported.
- **Lineage**
  - For both years, molecular investigation revealed that WNV infections were due to a lineage 2 and was related to the 2007 Volgograd (Russia) strain.

## Spain:

- **WNV Surveillance**
  - Regular WNV surveillance for humans is implemented in the country. Regular WNV surveillance for equine and birds are implemented in specific areas at risk in Spain.
- **Human cases**
  - In 2010, 2 WNV human cases were reported in Cadiz province. It was the 2<sup>nd</sup> human WNV case reported in the country. The 1<sup>st</sup> human case was occurred in 2004 and was retrospectively confirmed in 2006. The patient had been diagnosed in an area located of Southern Spain.
  - In 2011, no human case was reported.
- **Equine cases**
  - 2010: 16 equine cases have been reported in Cadiz province. They were the first equine cases ever reported to OIE.
  - In 2011, 11 equine cases were reported in the province of Cadiz.
- **Lineage**
  - Lineage 1 was detected in birds in 2007, in mosquitoes in 2008 and in horses in 2010.

## The Balkans

### Albania:

- **Human cases**
  - In 2010, one case (reported in 2011) was detected in a 14 year-old child in Korçe prefecture (South East, bordering Greece).
  - In 2011, 49 cases (15 confirmed) of WNV infections have been reported in humans. They were located in the coastal and in the central parts of Albania.
  - The 2010 and 2011 cases were the 1<sup>st</sup> clinical WNV infections reported in Albania. In 1958, WNV antibodies were detected in two human blood samples but no clinical cases were reported.
- **Equine cases**
  - In 2011, a seroprevalence survey in horses found 11% of positive cases.
- **Lineage**

Lineage 2 was detected in the confirmed human cases reported in 2011.

#### Cyprus:

- **WNV Surveillance**
  - There is a permanent human and equine WNV surveillance.
- **Human and equine cases**
  - No human or equine cases were reported in 2010 and 2011.

#### FYR-Macedonia:

- **WNV Surveillance**
  - Equine and birds surveillance were implemented in 2011 while permanent surveillance in humans was previously established.
- **Human cases**
  - In 2011, 4 WNV human cases were reported for the first time in the country.
- **Equine cases**
  - In 2011, 10 horses were reported to OIE.

#### Bosnia & Herzegovina

- **WNV Surveillance**
  - There is no human or equine surveillance system implemented in the country.
- **Equine cases**
  - In 2011, 250 horses were tested, all were negative.

#### Croatia:

- **WNV Surveillance**
  - Human and equine WNV surveillance is implemented in Croatia.
- **WNV circulation**
  - A sporadic evidence of infection has been found in asymptomatic individuals.
  - In 2001 and 2002, WNV infection was serologically confirmed in horses in Dakovo region (Eastern Croatia) in 4 out of 980 tested horses.
  - Since 2011, WNV cases in equine have to be mandatorily notified.
  - In 2011, a low intensity of WNV was found through sera testing in horses (veterinary surveillance. Seroprevalence surveys also showed a higher intensity in horses in the Eastern and continental parts of the country).

#### Kosovo:

- **WNV Surveillance**
  - There is a permanent passive human WNV surveillance.
- **Human and equine cases**
  - No human or equine cases were reported in 2010 and 2011.

#### Montenegro:

- **WNV Surveillance**
  - There is no specific WNV surveillance.
- **Human and equine cases**

- No human or equine cases were reported in 2010 and 2011.

#### Serbia:

- **WNV Surveillance**
  - WNV surveillance for humans, equine and birds is implemented in Serbia.
- **Human and equine cases**
  - There is no evidence (clinically or laboratory) of West Nile in the country.
  - A seroprevalence survey showed an 8% seropositivity in horses.

#### Slovenia:

- **WNV Surveillance**
  - There is no specific WNV surveillance, but there is occasional surveillance of cases presenting serious meningocencephalitis.
- **Human and equine cases**
  - No human or equine cases were reported in Slovenia in 2010 and 2011.

### North Africa and Middle-East

#### Algeria:

- **WNV Surveillance**
  - There is no specific WNV surveillance system implemented in the country.
- **Human and equine cases**
  - The latest human outbreak was reported in 1994 in the South of the country. About 50 suspect cases including 8 deaths were reported. Among the 18 samples collected, 16 had WNV antibodies.
  - In 2011 a seroprevalence survey in humans showed that among the 165 samples 16 (around 10%) tested positive for WNV antibodies.
  - In 2010 and 2011 neither WNV human or equine cases were reported in the country.

#### Egypt:

- **WNV Surveillance**
    - There is no information on any specific WNV surveillance system implemented in the country.
  - **WNV circulation**
    - In 2010 and 2011, no human or equine cases were officially reported in Egypt.
    - A prospective [cohort study](#)<sup>8</sup> carried out in Egypt in 5 study sites between 1999 and 2002 showed that 24% (1.431/5.965) of the enrolled individuals had WNV-IgG antibodies. In the 3 Nile valley sites, a 15% seroconversion rate was observed among people enrolled.
- Seroprevalence rates were significantly higher than in the 2 sites located in the Sinai. High seroconversion rates were also detected among

<sup>8</sup> Soliman A, Mohareb E, Salman D, Saad M, Salama S, Fayez C, et al. Studies on West Nile virus infection in Egypt. J Infect Public Health. 2010;3(2):54-9

the sentinel chicken and WNV were isolated from both chicken sera and mosquito pools.

The authors of this study suggest that WNV is circulating in human in Egypt especially in the Nile Delta and in the Nile valley where the majority of the Egyptian population lives.

#### Israel:

- **WNV Surveillance**
  - Permanent WNV surveillance for humans, equine and birds is implemented in the country.
- **WNV circulation**
  - Israel is on a major birds' migration route between Eurasia and Africa. WNV is endemic in Israel since 1947 and caused large outbreaks in the 1950's followed by an interruption of transmission between 1974 and 2000.
- **Human cases**
  - The biggest outbreak (435 cases) occurred in 2000, followed by smaller outbreaks in 2005 (102 cases), and 2007 (107 cases).
  - In **2010**, 114 human cases were reported.
  - In **2011**, 45 cases were reported
- **Equine cases**
  - In 2010, 8 cases in horses were reported.
  - In 2011, 11 equine cases were reported.

#### Morocco:

- **WNV Surveillance**
  - WNV surveillance system for human, equine and birds is implemented in the country.
- **Human cases**
  - No WNV human infections were reported in 2010 and in 2011.
  - The first human WNV infection was reported in 1996 (1 case) during an outbreak among horses (94 cases including 42 deaths). Since then, no human infection has been reported.
  - In **2010**, a serological survey in humans identified 11 positive cases (IgM positive), these results are in favour of a recent WNV circulation in the country.
- **Equine cases**
  - **2010**, 24 equine cases (including 10 deaths) were reported in Benslimane, Khemisset, Mohammedia and Casablanca provinces.
  - The previous equine WN outbreak occurred in September and October 2003 in the province of Kenitra (8 equine cases including 5 deaths).
  - Following the 2010 WN outbreak, Morocco reinforced veterinary controlled measures (including horse vaccination campaigns).
  - In **2011**, no equine cases were reported.

#### Jordan:

- **WNV Surveillance**
  - Permanent human WNV surveillance is implemented in the country.
  - In 2010, a seasonal clinical equine and bird surveillance is implemented.

- **Human cases**
  - In **2011**, 2 suspected cases were reported but they could not be biologically confirmed.

#### Lebanon:

- **WNV Surveillance**
  - There is no specific WNV surveillance system implemented in Lebanon.
- **Human and equine cases**
  - No human or equine cases have been reported in Lebanon in 2010 and 2011.
  - A seroprevalence [survey](#) done in Beirut in 2006 among blood donors showed that less than 1% of the 639 individual were positive.

#### Libya:

- **WNV Surveillance**
  - A permanent human surveillance is implemented in Libya.
- **Human and equine cases**
  - No WNV human or equine infections were reported in 2010 and in 2011.

#### Palestine:

- **WNV Surveillance**
  - WNV surveillance for humans, horses and birds is implemented in the country.
- **Human cases**
  - The last human autochthonous case was reported in **2010** in Tulkarem.
  - Previous cases occurred in 2006 (3 WNV cases in Qalqelia district), in 2008 (2 cases in Qalqelia) and in 2009 (one case in Jericho).
- **Equine cases**
  - No equine case was reported in 2010 and 2011.

#### Syria:

- **WNV Surveillance**
  - There is no specific WNV surveillance but reported suspect cases are investigated.
- **Human and equine cases**
  - No human or equine cases were reported in 2010 and 2011 in the country.

#### Turkey:

- **WNV Surveillance**
  - WNV surveillance system for humans and equine is implemented in Turkey.
- **Human cases**
  - In **2010**, 47 human cases (including 10 deaths) were reported in Aegean and Marmara regions. These were the first cases ever reported in the country.

- In **2011**, 5 human cases including 3 probable in the western coastal provinces of Antalya, Mugla and Sakarya and 2 confirmed human cases in Aydin and Antalya provinces were reported in Turkey. Seroprevalence surveys have been implemented in the country to better document viral circulation.
- **Equine cases**
  - In 2010, 2 equine cases were reported in Izmir province (Aegean region).

#### Tunisia:

- **WNV Surveillance**
  - WNV surveillance system for humans is implemented in Tunisia.
- **Human cases**
  - Previous human cases were reported in 2003: 31 confirmed human cases were detected in Monsatir, Mahdia, Sousse, Sfax and Gabès governorates.
  - In **2010**, 3 human cases were reported in Jendopuba and Tataouine.
  - In **2011**, 3 human cases were reported in Kebili (South-west of the country).
- **Equine cases**
  - No equine case was reported in 2010 - 2011.

### Non EpiSouth neighbouring countries

#### Russia:

- 2010: from 16 July to 4 October at least 552 human cases including 6 deaths were reported to MoH. Of these cases, 409 cases (including 5 deaths) were reported in Volgograd province (77% in Volgograd city). The other cases were reported in Rostov, Voronezh, Krasnodar, Astrakhan, Kalmoukia, Tatarstan and Chelyabinsk oblasts.
- In **2011**, 153 cases were reported in the country, including 61 in Volgograd province. In comparison to 2010, one additional oblast was affected (Tambov) while no case was reported in Chelyabinsk).

#### Hungary:

- In **2010**, 11 confirmed human cases were reported by Hungarian health authorities.
- In **2011**, 3 WNV human cases were reported in Hajdu-Bihar (North East of the country), Pest and Szabolcs-Szatmar-Bereg counties<sup>9</sup>.

#### Ukraine:

- In **2010**, no human WNV case was reported.
- In **2011**, 8 WNV cases were reported in humans in 3 different oblasts: Donets'ka (3), Mykolayivs'ka (2) and Zaporiz'ka (3).

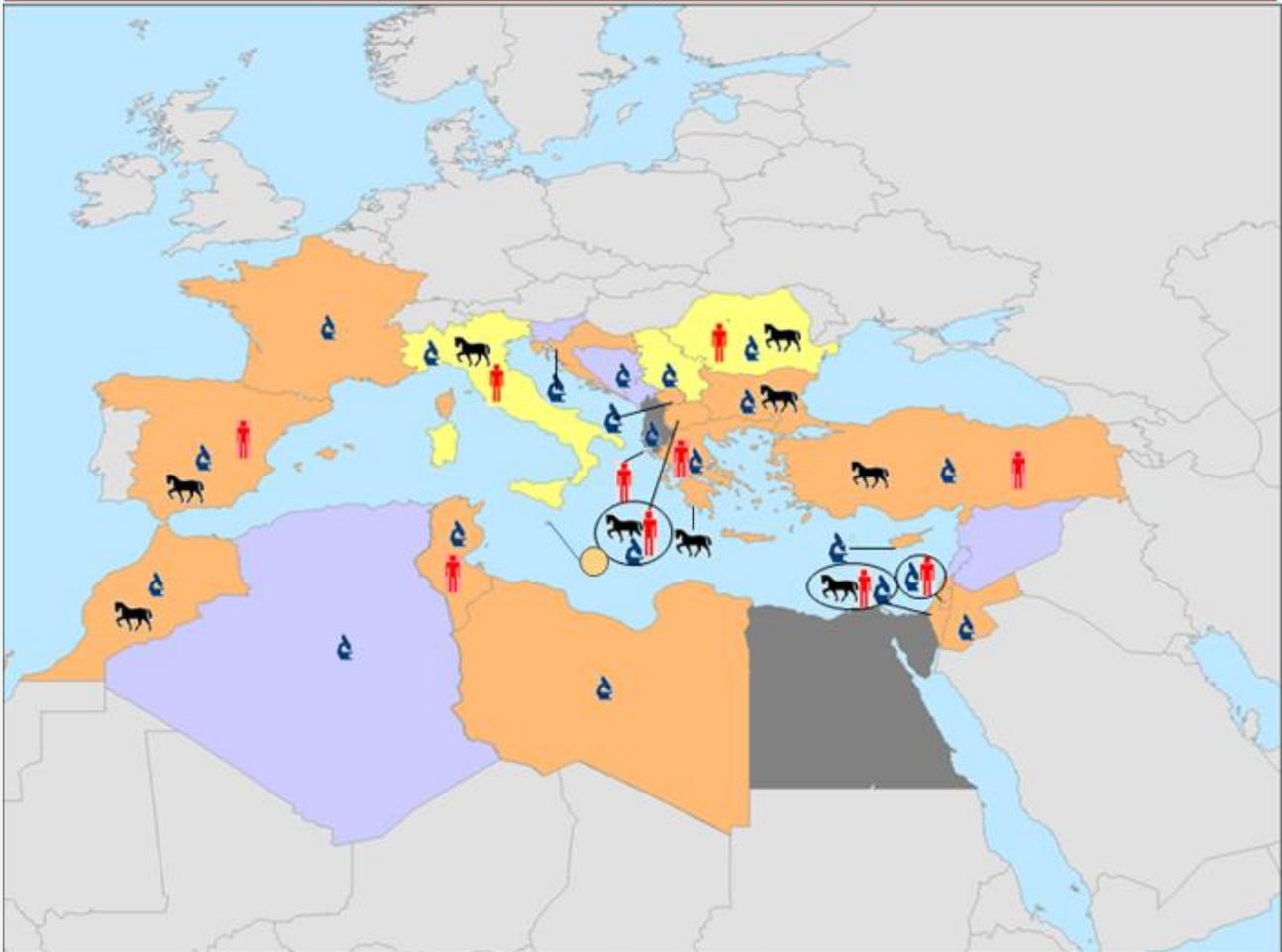
### Conclusion

- Although number of reported cases was lower, the 2011 season confirmed the unusual WNV dynamic in the Mediterranean basin observed in 2010. During both years, human and equine cases were reported across the region in Southern Europe, North Africa, Balkan and Middle East areas.
- Fewer human cases were reported but additional affected areas were reported with previously affected countries (Albania, Italy, Greece, Romania and Tunisia) and also in a not previously affected country (FYR-Macedonia). Nevertheless on a larger scale the affected region remains comparable to the one observed in 2010.
- During both 2010 and 2011 seasons, viral circulation was more intense in the Eastern part of the Mediterranean while viral activity remained moderated in the Western part.
- Lineage 2 was isolated in at least 3 countries of the Eastern part of the region and in Italy, while lineage 1 was detected in the west only. The concomitant circulation of two different strains across the area seems likely.
- The introduction of a lineage 2 strain in the recent years in the eastern part of the Mediterranean area could explain the intensified WNV viral circulation observed in the Balkan and Black Sea area in 2010 and 2011. Unfortunately, data are insufficient to fully validate this hypothesis.
- The co-circulation of Lineages 1 and 2 in Italy may suggest an introduction of the Lineage 2 in Western Europe with an impact on the virulence of the disease that is difficult to predict.
- Genetic information allowing describing viral circulation in 2010-2011 is too scarce to allow detailed description of the WNV dynamic. Emphasis should be put on gathering necessary data during the 2012 summer season (if available).
- During both years main outbreaks occurred on sites located in the main bird migration routes and sustained transmission cannot be excluded in the coming years.

<sup>9</sup> Cf. [ECDC](#)

MAP 2

2011 West Nile surveillance, laboratories and WNV circulation in EpiSouth countries, as of 24/04/2012



Data EpiSouth / map Di-InVSI/ esri basemap

**Human WNV surveillance (areas or whole country)**

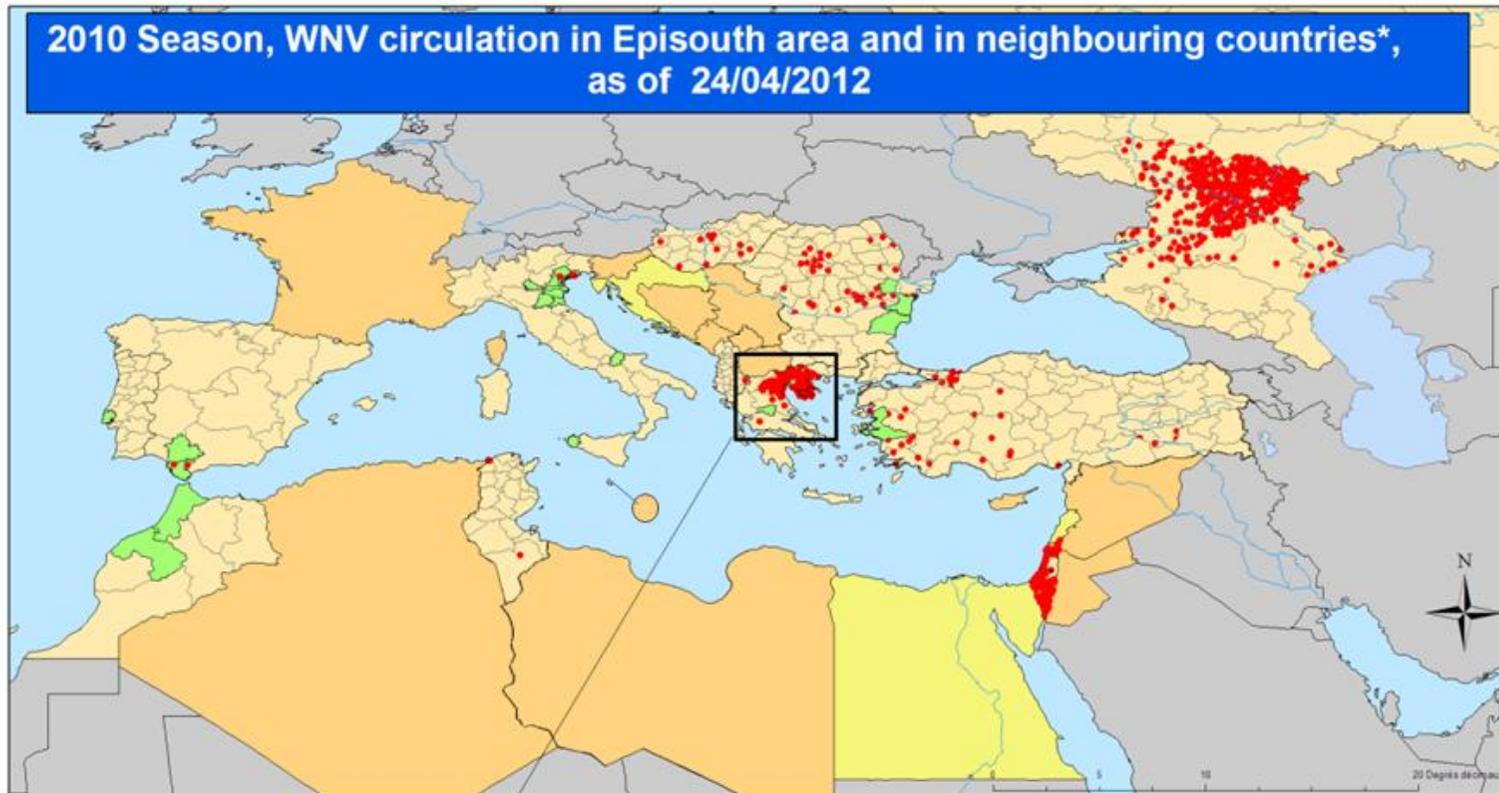
- Permanent surveillance
- Seasonal surveillance
- No WNV surveillance
- No information
- Non EpiSouth Countries

**Lab, human & equine WNV cases**

- Functional WNV reference laboratory
- WNV Human cases (2010 and/or 2011)
- WNV equine cases (2010 and/or 2011)

MAP 3

2010 Season, WNV circulation in Episouth area and in neighbouring countries\*, as of 24/04/2012



**LEGEND**

**Human cases\*\***

● 1 point = 1 case

**Equine cases**

□ No equine cases reported

■ Equine cases reported

**Viral circulation**

□ No reported WNV circulation

■ Seroprevalence study documenting WNV circulation\*\*\*

□ Non EpiSouth / no information



\*Russia, Hungary, Portugal

\*\*Cases are randomly located by administrative units or by countries (for Israel)

Greece : only neuro invasive cases represented, source KEELPNO

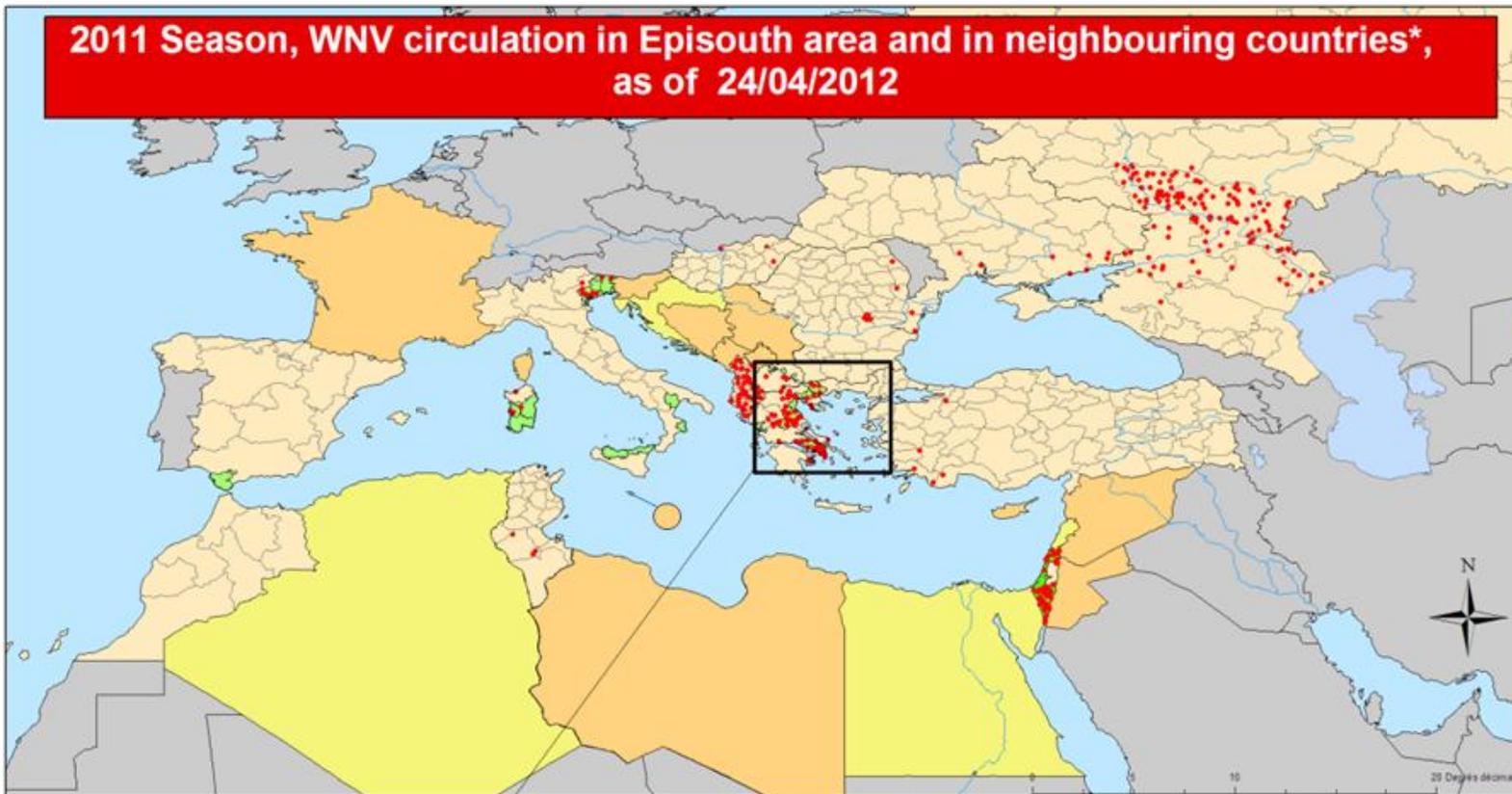
Romania: 47 out of the 57 cases represented

\*\*\*Studies not older than 2005, in countries which have not reported equine or human confirmed cases

Sources OIE, MoH, MoA, EpiSouth / map DI-InVS/ esri basemap

MAP 4

**2011 Season, WNV circulation in Episouth area and in neighbouring countries\*, as of 24/04/2012**



**LEGEND**

**Human cases\*\***

● 1 point = 1 case

**Equine cases**

○ No equine cases reported

● Equine cases reported

**Viral circulation**

○ No reported WNV circulation

● Seroprevalence study documenting WNV circulation\*\*\*

○ Non Episouth / no information

\* Russia, Hungary, Ukraine

\*\* Cases are randomly located by administrative units or by countries (for Albania, Israel and FYR-Macedonia)

Greece : only neuro invasive cases represented, source KEELPNO

Romania: only confirmed cases represented

\*\*\*Studies not older than 2005, in countries which have not reported equine or human confirmed cases



Sources OIE, MoH, MoA, EpiSouth / map DI-InVS/ esri basemap