

# SIX YEARS OF WEST NILE VIRUS SURVEILLANCE IN THE EMILIA-ROMAGNA REGION, ITALY



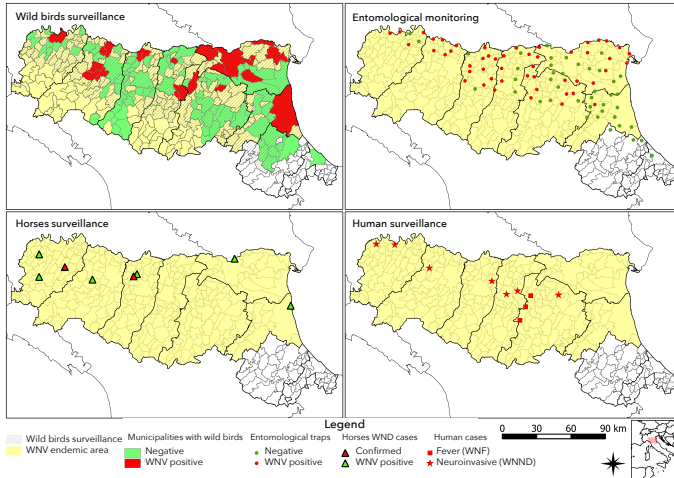
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## OBJECTIVE

This work reports the results of the first six years of WNV surveillance (2009-2014) which could be useful to modulate the NAT-PCR testing activity on human blood donations.

### Integrated WNV surveillance in Emilia-Romagna, 2014



**RESULTS** Entomological and veterinary surveillance detected the circulation of a **lineage 1 WNV strain** in 2009 and 2010 in ER (Tab. 1). In 2009, nine WNNND human cases were notified, none in 2010. In the next two years neither virus circulation, nor WNNND cases were detected. In July 2013 a new strain, **lineage 2 WNV**, was found in mosquitoes, birds and horses and 20 WNNND human cases were notified [4]. In 2014, the circulation of lineage 2 was again detected and seven WNNND human cases occurred.

During the first six years of surveillance (2009-2014), entomological and veterinary surveillance have always detected WNV circulation before the occurrence of WNNND human cases (mean=34.3 days, median=30; range: 20-54). Moreover, human cases have never occurred more than 30 days after the last detection of WNV in mosquitoes, horses or birds (Tab. 2).

**Tab. 2** Lag time between first and last WNV detection (veterinary and entomological surveillance) and first and last dates of occurrence of WNNND cases in Emilia-Romagna, 2009-2014

Year	Province	Date of onset of symptoms in human WNNND cases		Lag time between first WNV detection (veterinary and entomological surveillance) and first WNNND case, nr of days (type of surveillance)*	Lag time between last WNV detection (veterinary and entomological surveillance) and last WNNND case, nr of days (type of surveillance)*
		FIRST	LAST		
2009	Bologna	25-Aug	01-Sep	-35 (M)	64 (B)
2009	Ferrara	19-Aug	12-Sep	-27 (H)	19 (H)
2009	Modena	27-Aug	27-Sep	-35 (M)	17 (H)
2013	Modena	03-Aug	08-Sep	-31 (M)	29 (B)
2013	Ferrara	06-Aug	05-Sep	-20 (M)	39 (B)
2013	Bologna	15-Aug	15-Aug	-29 (M)	47 (B)
2013	Reggio E.	16-Aug	15-Sep	-30 (M)	12 (B)
2013	Parma	11-Sep	11-Sep	-54 (M)	17 (B)
2014	Bologna	25-Aug	25-Aug	-47 (M)	19 (B)
2014	Modena	20-Aug	26-Aug	-28 (M,B)	7 (M)
2014	Piacenza	03-Sep	13-Sep	-29 (M)	4 (H)
2014	Parma	25-Aug	25-Aug	-52 (M)	15 (M)
2014	Reggio E.	27-Aug	27-Aug	-29 (B)	27 (M)

\* Mosquitoes (M), birds (B), horses (H)

**INTRODUCTION** West Nile virus (WNV) is a mosquito-borne Flavivirus. It circulates in nature between Culicinae mosquitoes and birds. Mosquitoes can bite and occasionally cause neuroinvasive disease in incidental dead-end hosts, such as humans and horses.

An iatrogenic transmission via blood transfusion and solid organ transplantation has been reported in humans [1]. To avoid WNV transmission via blood transfusion, the procedures issued by the National Blood Centre provide that WNV Nucleic Acid Test (NAT-PCR) on blood donations shall be introduced in a province after the notification of a human case of West Nile neuroinvasive disease (WNNND). Testing shall be continued until November 30. Testing shall be performed from 1 July to 30 November also in provinces where WNNND human cases occurred in the previous five years [2].

Following the first detection of WNV circulation in summer 2008, an integrated surveillance programme of WNV in humans, animals and mosquitoes has been implemented in the Emilia-Romagna (ER) region since 2009 [3].

**MATERIALS & METHODS** Integrated surveillance programme carried out at province level [3]:

entomological monitoring	veterinary surveillance	human surveillance
active surveillance focused on <i>Culex pipiens</i> RT-Real-Time-PCR	active & syndromic surveillance wild birds, mainly corvids RT-Real-Time-PCR	active surveillance all human cases of neuroinvasive disease RT-Real-Time-PCR
	syndromic surveillance horses IgM ELISA on neurologic cases	

**Tab. 1** Results of the integrated WNV surveillance in Emilia-Romagna, 2009-2014

Year	Mosquito pools		Birds		Neurologic Horses		Human Patients	
	WNV positive	Tested	WNV positive	Tested	IgM positive	Tested	WNNND confirmed	Tested
2009	27	1790	45	1271	26	46	9	78
2010	1	2180	2	891	0	12	0	113
2011	0	1447	0	966	0	4	0	66
2012	0	1753	0	1394	0	11	0	74
2013	105	2268	173	2230	7	12	20	199
2014	95	2993	51	3289	2	10	7	227

## CONCLUSIONS AND RELEVANCE

In our opinion, the beginning and the end of the testing period for human blood donations could be modulated according to the results of the entomological & veterinary surveillance.

