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West Nile Disease surveillance in Italy

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Contents

- 2002-2008 WND Surveillance plan
- 2009-2010: the new plan
- Data collection and dissemination
- Training

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First outbreak in Italy: 1998

In late summer 1998 cases of neurological sindromes in horses were notified in Tuscany, in the area named Padule di Fucecchio.

Outbreak summary:

8 Horse stables
1 Hyppodrome (Montecatini)
8 Municipalities
14 Horses with clinical symptoms
6 Deaths
NO Disease in humans, 4 Seropositives

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Surveillance plan

Surveillance objectives

To monitor the possible re-introduction and spread of the virus in Italy

Through:

- an early warning system based on:
  - -the deployment of sentinel chickens;
  - -the monitoring of wild birds mortality;
- the monitoring of mosquito fauna;
- the monitoring of WNV seroprevalence in horses.

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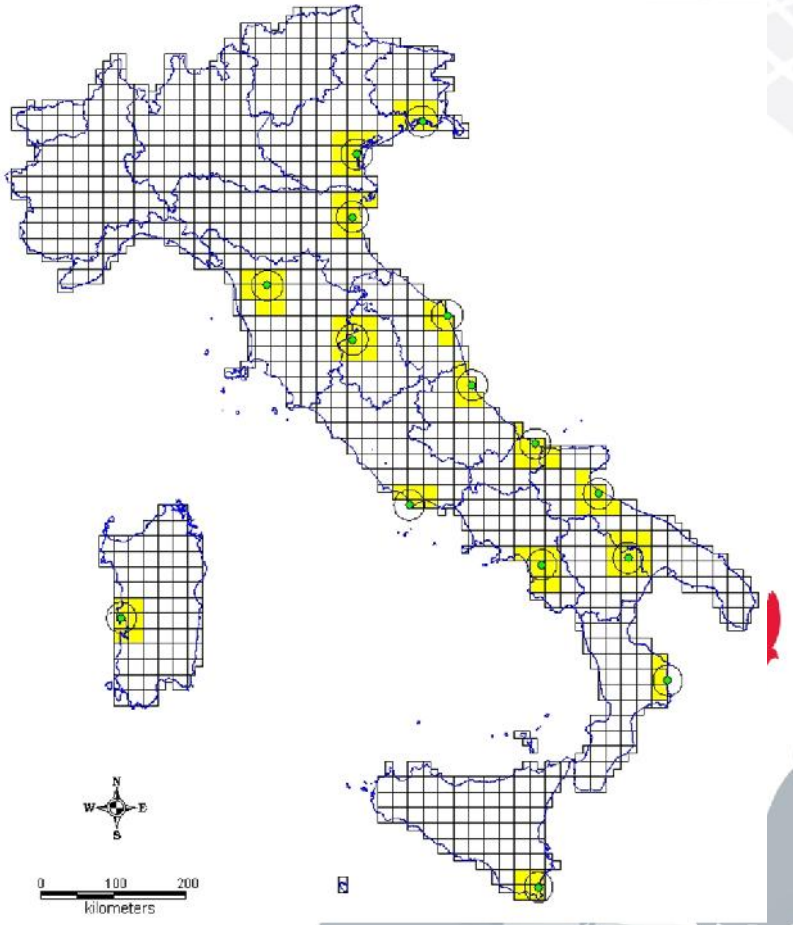
Preliminary Steps: Definition and location of the areas at risk of WNV introduction

Italy was divided into a grid of square units of 400 Km^2 (20 km each side) using a GIS application. The extent of the area under study within the area at risk included all the squares (monitoring sites) cut by a 20 km buffer drawn around the coordinates of centroids.



Surveillance in birds

1) Viral screening on carcasses of dead birds found in the areas “at risk”;
2) Viral and serological screening of blood samples and cloacal swabs.

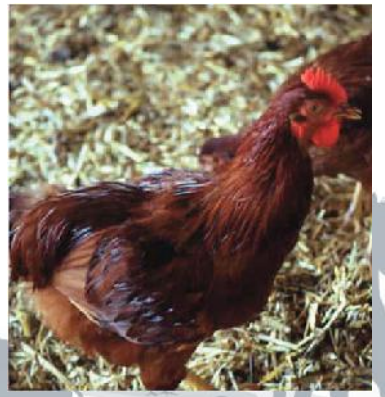
Surveillance in birds

Sentinel Chickens

Each monitoring site (of 400 km^2 width) was to be stocked with a cage with two flocks of 10 pretested, non-immune, individually banded captive chickens bled every 15 days alternately throughout the transmission season.

Sensitivity of the system:

Monthly incidence of 25% with 95% confidence.



Surveillance in horses

In each monitoring site, a statistically meaningful number of horses (sentinels) bled twice before and after the transmission season.

Sensitivity of the system:

Yearly incidence of 25% with 95% confidence.

Passive surveillance: detection of clinical symptoms

Monitoring of mosquito fauna

Census of larval foci:

every two month during the 1st year

Collection of adult mosquitoes using CO2 traps:

every month during the 1st year

Collection of preimaginal stages of mosquitoes:

every 15 days

Collection of adult mosquitoes using CDC-light Traps:

every 15 days

Collection of adult mosquitoes using aspirators in resting sites:

every 15 days

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Surveillance results

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Surveillance in wild birds

Wild birds surveillance	2002	2003	2004	2005	2006	2007
N° of Free ranging and dead birds tested	115	452	755	334	77	92
N° of Birds sera tested	104	343	185	25	52	82
N° of Dead birds	13	17	128	309	31	11
N° of Birds swabbed	100	126	462	-	-	33
N° of IgG-ELISA positive birds	0	5	0	0	0	0
N° of IgM-ELISA positive birds	0	0	0	0	0	0
N° of VN-positive birds	0	2	0	0	0	0
N° of VI-positive birds	0	0	0	0	0	0

Species

1 Mallard
1 Canada goose
3 Unknown

Species

2 Unknown

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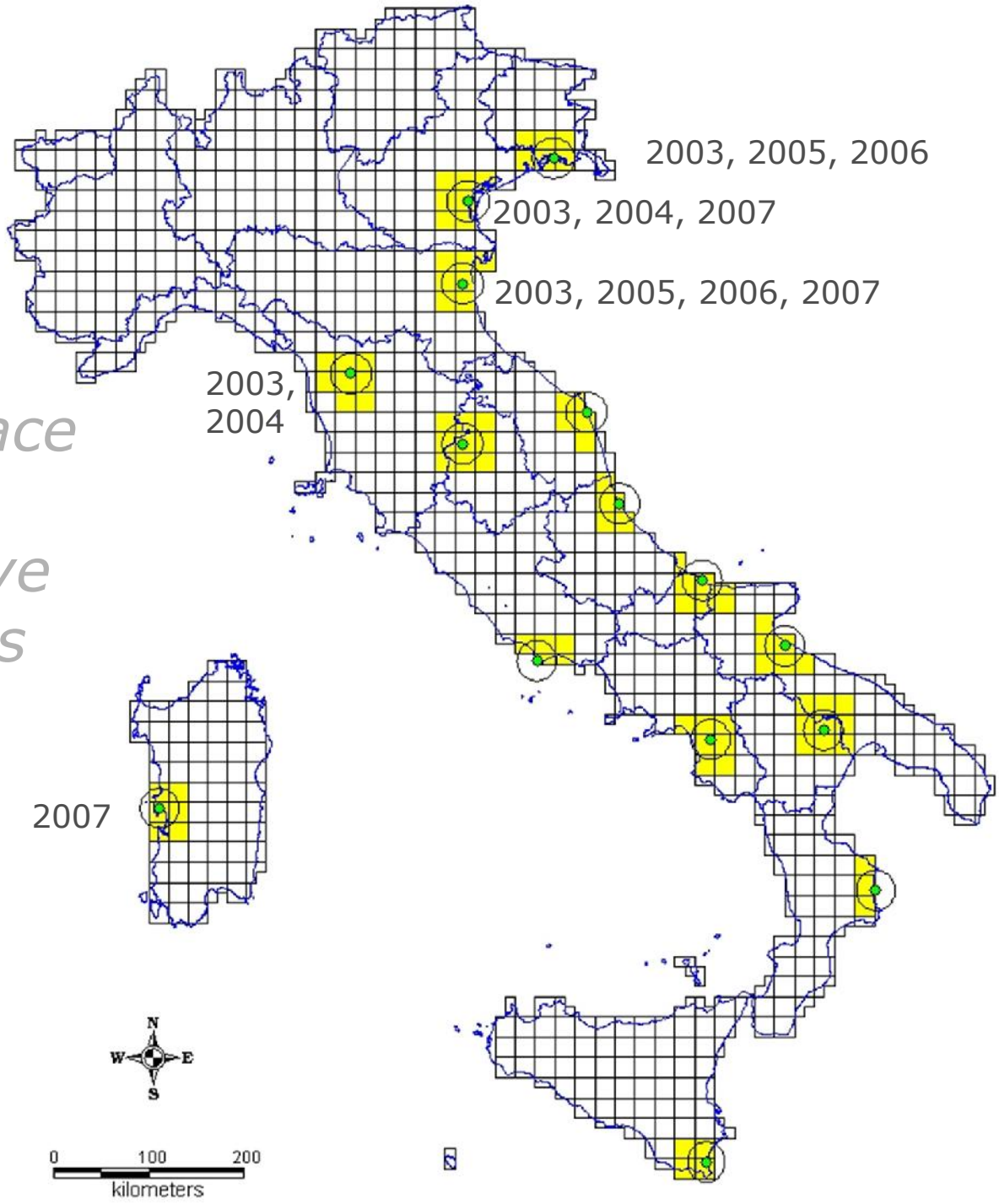
Surveillance in sentinel chickens

Surveillance in sentinel chickens						
	2002	**2003**	**2004**	**2005**	**2006**	**2007**
ELISA IgG positives	0	34	14	2	6	7
VN confirmed	0	0	0	1	0	0

Total no. of chickens used per year

≅ **700**

Distribution in space and time of ELISA IgG positive sentinel chickens



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Surveillance in horses

Seroconversions in sentinels

	Transmission season											
Surveillance	**2002**		**2003**		**2004**		**2005**		**2006**		**2007**	
Areas at risk (North to South order)	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+
LAGUNA DI GRADO E MARANO	-	-	9	-	-	-	22	-	19	-	-	-
VALLE AVERTO-LAGUNA SUD DI VENEZIA	-	-	13	-	32	-	-	-	10	-	-	-
VALLI DI COMACCHIO	-	-	1	-	-	-	35	1	54	-	-	-
PADULE DI FUCECCHIO	-	-	38	-	-	-	64	-	42	-	-	-
SENTINA	-	-	2	-	-	-	4	-	3	-	-	-
LAGO TRASIMENO	-	-	-	-	-	-	30	-	9	-	-	-
FOCE DEL FIUME VOMANO	-	-	-	-	-	-	-	-	-	-	-	-
FOCE DEL BIFERNO	-	-	-	-	-	-	6	-	-	-	-	-
MANFREDONIA	-	-	11	-	13	-	8	-	-	-	-	-
LAGO DI SABAUDIA	-	-	17	1	-	-	13	-	16	-	-	-
LAGO DI SAN GIULIANO	-	-	62	-	-	-	-	-	-	-	-	-
SERRE PERSANO	-	-	-	-	-	-	-	-	-	-	-	-
STAGNO DI S'ENA ARRUBIA	-	-	-	-	-	-	-	-	8	-	-	-
FOCE DEL FIUME NETO	-	-	-	-	-	-	-	-	-	-	-	-
STAGNI COSTIERI DI VENDICARI	-	-	12	-	-	-	-	-	3	-	-	-
Total	**0**	**0**	**165**	**1**	**45**	**0**	**182**	**1**	**164**	**0**	**0**	**0**

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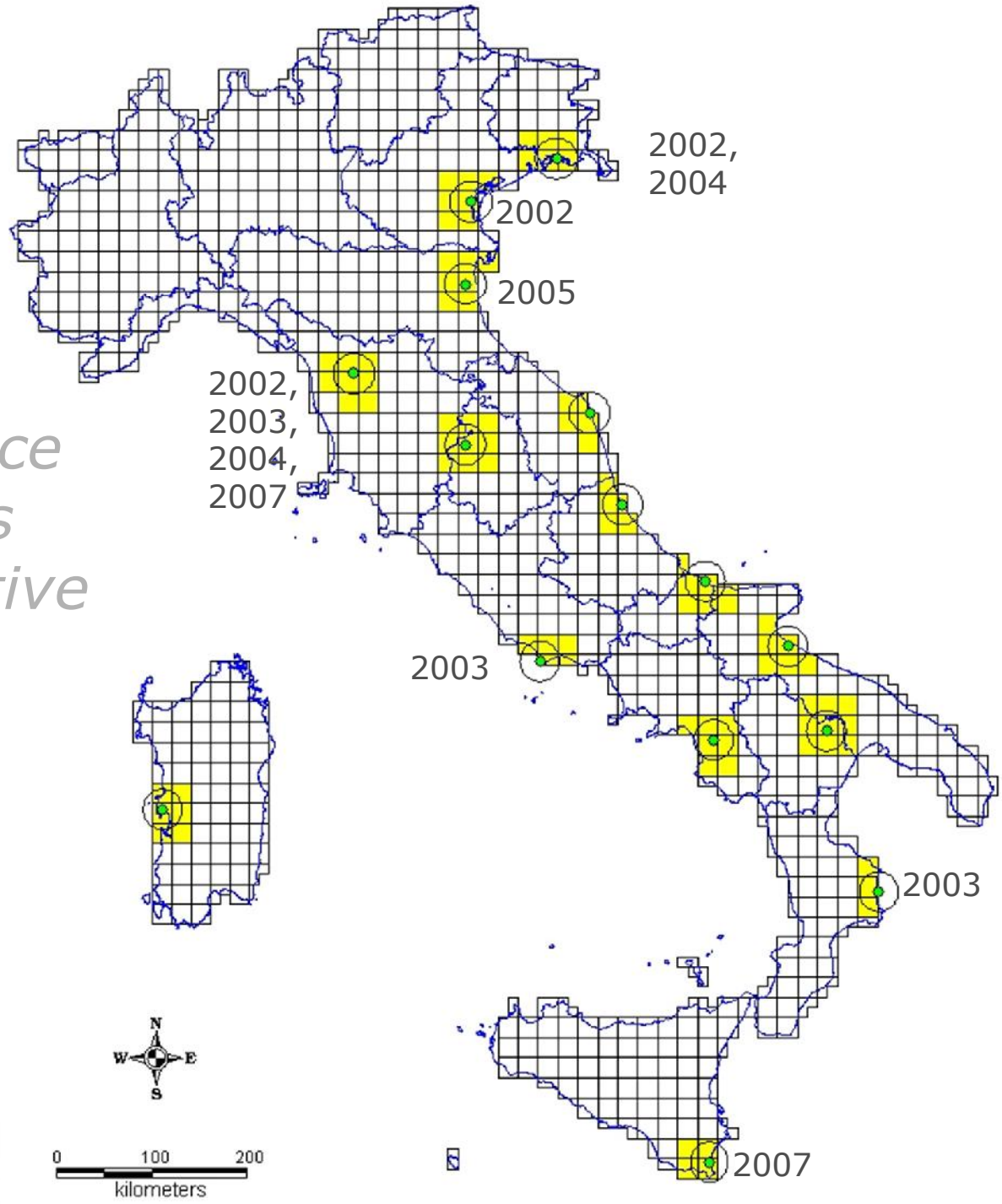
Surveys in horses

Random samplings

Survey	Transmission season											
	2002		2003		2004		2005		2006		2007	
Areas at risk (North to South order)	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+	VN-	VN+
LAGUNA DI GRADO E MARANO	62	1	69	-	33	1	57	-	23	-	42	-
VALLE AVERTO-LAGUNA SUD DI VENEZIA	98	1	77	-	52	-	118	-	24	-	78	-
VALLI DI COMACCHIO	103	-	62	-	22	-	63	-	37	-	61	-
PADULE DI FUCECCHIO	186	26	105	1	87	3	118	-	41	-	134	1
SENTINA	64	-	20	-	48	-	80	-	49	-	53	-
LAGO TRASIMENO	160	1	59	-	42	-	96	-	42	-	53	-
FOCE DEL FIUME VOMANO	26	-	-	-	-	-	-	-	-	-	-	-
FOCE DEL BIFERNO	27	-	59	-	4	-	7	-	3	-	18	-
MANFREDONIA	15	-	30	-	47	-	9	-	20	-	63	-
LAGO DI SABAUDIA	36	-	77	3	10	-	43	-	27	-	85	-
LAGO DI SAN GIULIANO	158	-	82	-	18	-	13	-	-	-	-	-
SERRE PERSANO	67	-	-	-	-	-	30	-	-	-	-	-
STAGNO DI S'ENA ARRUBIA	18	-	19	-	35	-	27	-	7	-	19	-
FOCE DEL FIUME NETO	-	-	29	2	-	-	1	-	-	-	5	-
STAGNI COSTIERI DI VENDICARI	18	-	80	-	55	-	64	-	37	-	307	2
Total	**1038**	**29**	**768**	**6**	**453**	**4**	**726**	**0**	**310**	**0**	**918**	**3**

Distribution in space and time of Virus Neutralization positive horses



2008 outbreak

- After the epidemic in Tuscany, no further WNV clinical outbreaks were observed in Italy until August-September 2008;
- the 20th of August 2008 the first suspicion of West Nile encephalitis in horse stable in Ferrara Province closer to Po river and less than 50 km far from the Comacchio wetlands, one of those at risk areas selected in WNV national surveillance program.

Italian outbreaks

Outbreaks **2008;**

Outbreaks **1998;**

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2008 WND epidemic

- A total of 18 clinical outbreaks out of a total of 251 WND outbreaks in horse stables
- 4% of infected animals showed clinical signs
- 15.6% case fatality rate

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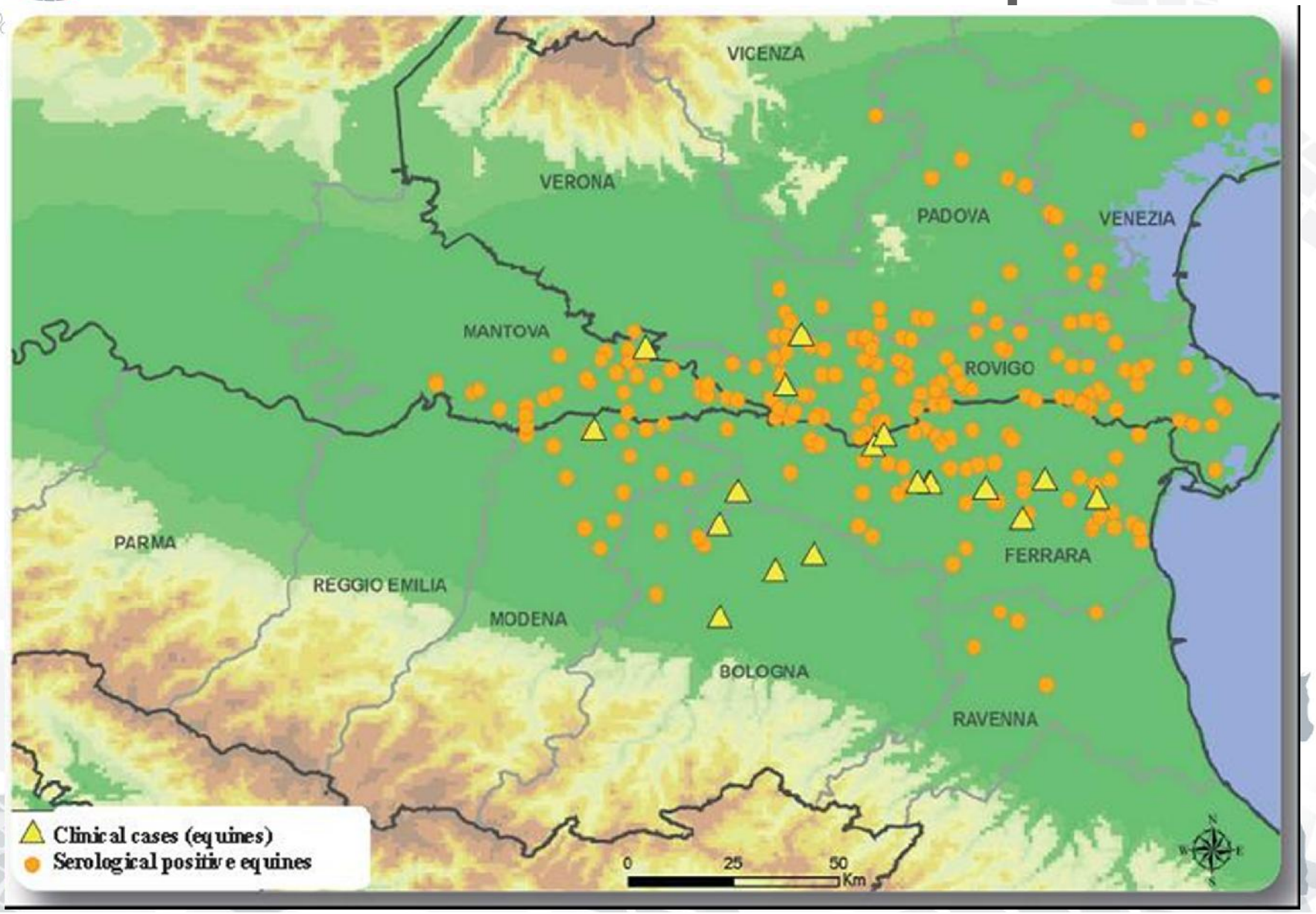
2008 WND epidemic

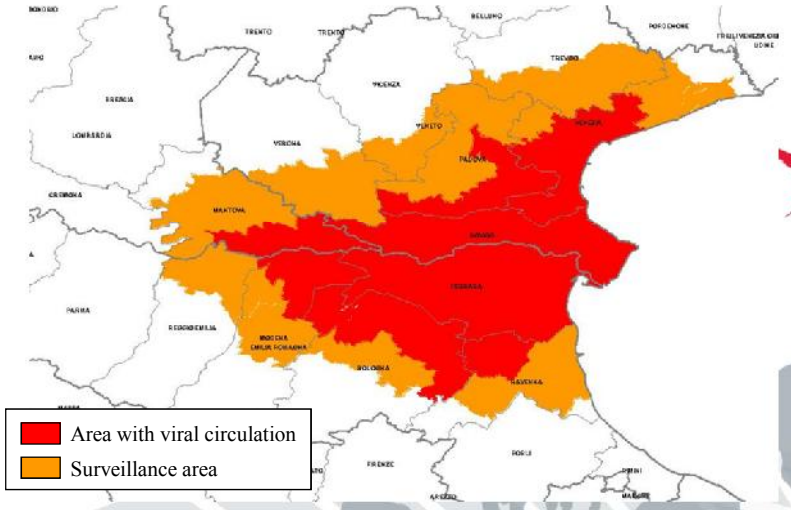


WNF case definition

- Horses:
  - Any autochthonous case of ataxia or sudden death in equines in the area at risk as well as any equine animal showing clinical signs compatible with WNF and confirmed by lab results (IgM-ELISA, IgG virus neutralization, RT-PCR, plaque reduction neutralization tests, virus isolation)
  - In absence of clinical signs even a serological positive result in free areas was considered a suspected case of WNV infection.
- Mosquitoes – Birds: RT-PCR-ve as evidence of virus circulation

2009 WND surveillance plan

- 3 Geographical Areas
  - Area with virus circulation in 2008 [AVC]
  - Surveillance Area [SA] (20 km from AVC)
  - Rest of Italy: 15 at risk wetland areas [RA]



2009 WND surveillance plan
Surveillance on birds

- Resident wild birds (magpies, crows, pigeons)
- Sentinel chicken flocks
- Monitoring of backyard poultry farms

FROM MARCH TO OCTOBER

Applied in AVC, SA and RA

2009 WND surveillance plan
Surveillance on horses

- Sentinel horses

  FROM APRIL TO SEPTEMBER

  Applied in SA and RA

- Syndromic surveillance (the whole Italian territory)

2009 WND surveillance plan
Entomological Surveillance

- Trapping in selected horse stables

FROM MARCH TO OCTOBER

Applied in AVC, SA and RA

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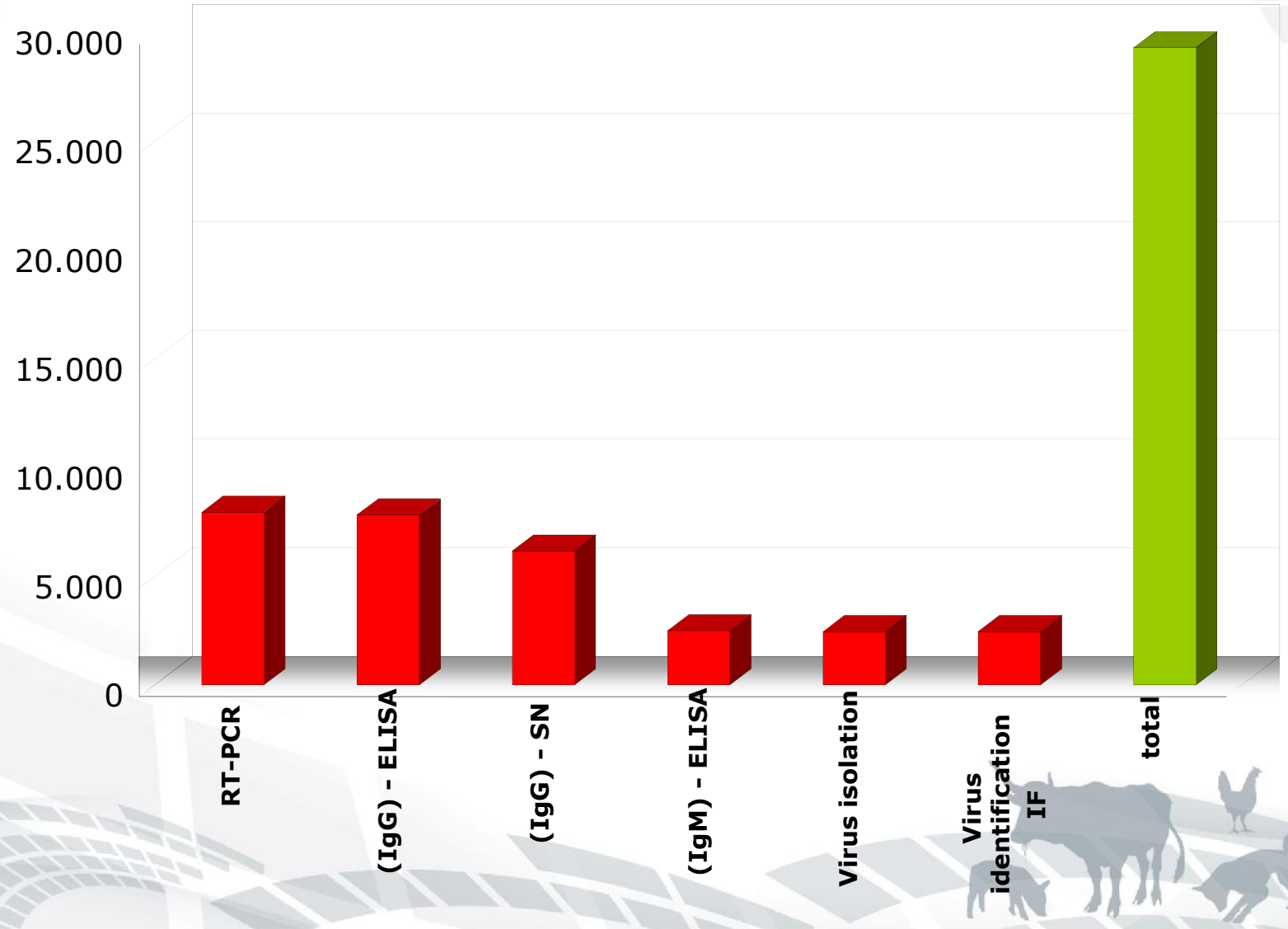
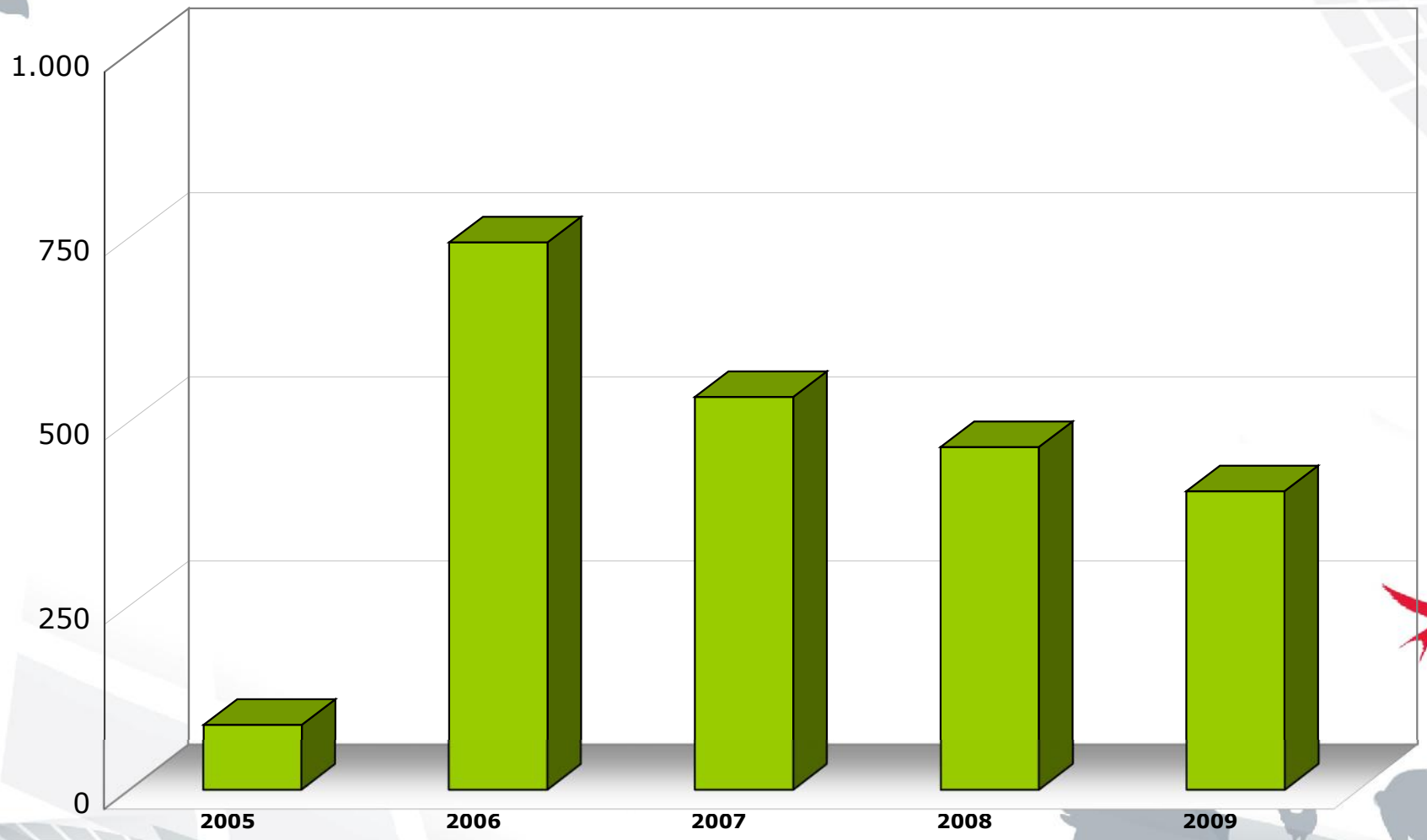
WND
No. of tests performed 2009



WND – No. of mosquitoes collections



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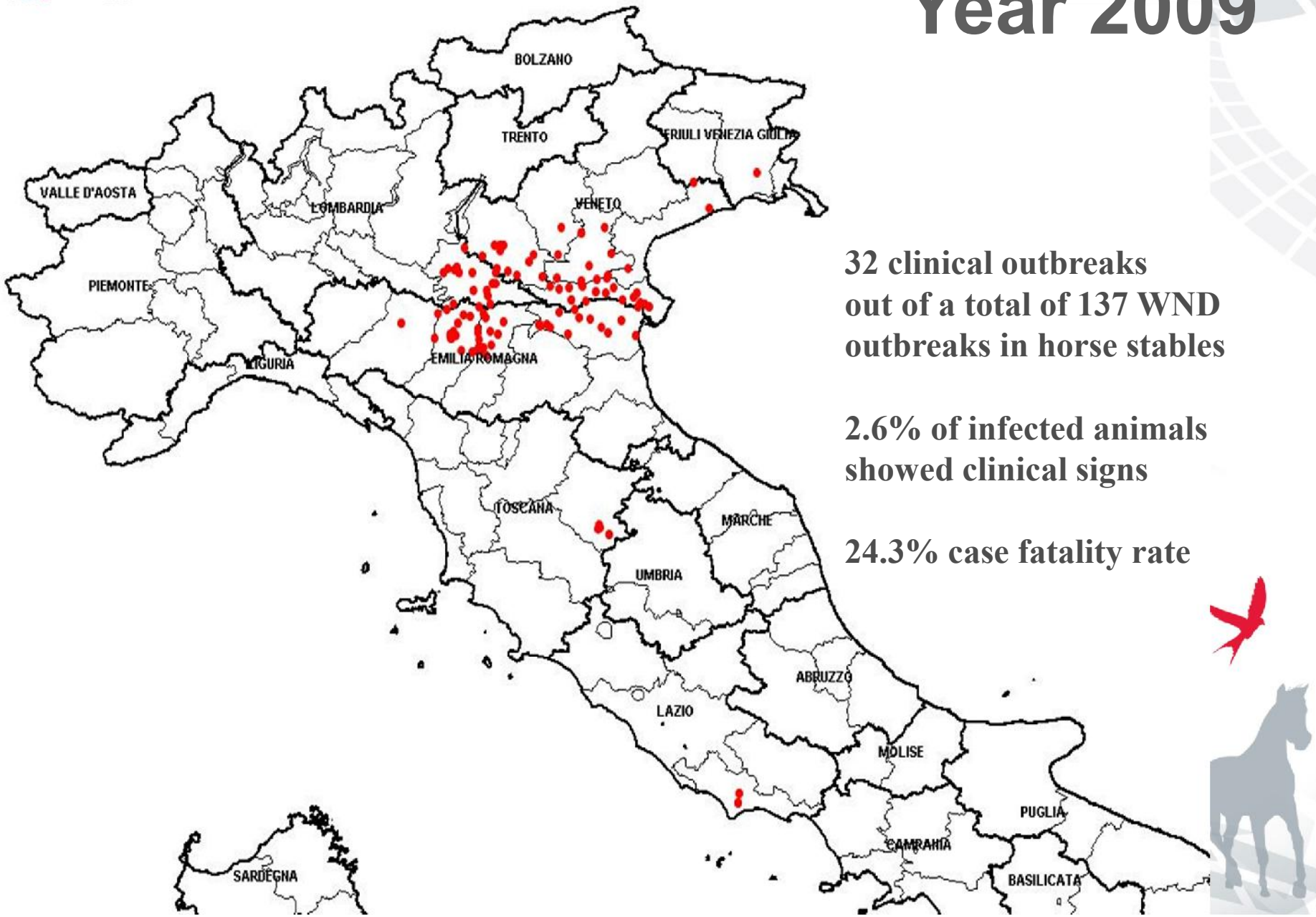
Year 2009



32 clinical outbreaks out of a total of 137 WND outbreaks in horse stables

2.6% of infected animals showed clinical signs

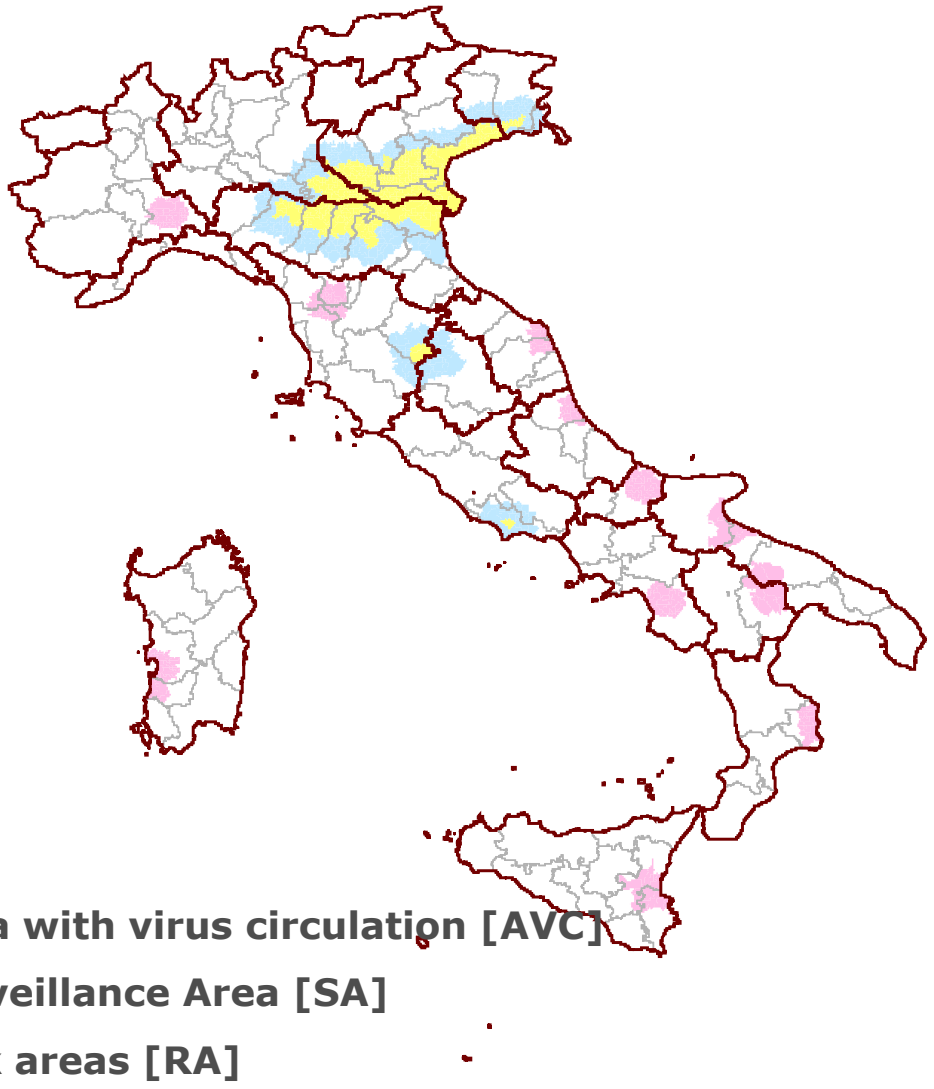
24.3% case fatality rate

Human cases in Italy

- 2008
  - ✓ 9 WNV infection cases in Bologna, Ferrara and Rovigo provinces
    - ✓ 4 characterized by neuroinvasive disease
- 2009
  - ✓ 18 human cases of infection
    - ✓ 17 characterized by neuroinvasive disease
      - 10 cases in Emilia Romagna
      - 6 cases in Veneto
      - 2 cases in Lombardia

Surveillance plan 2010 update

- Following 2009 outbreaks the surveillance plan was updated with the inclusion of new infected areas
- The same activities were foreseen



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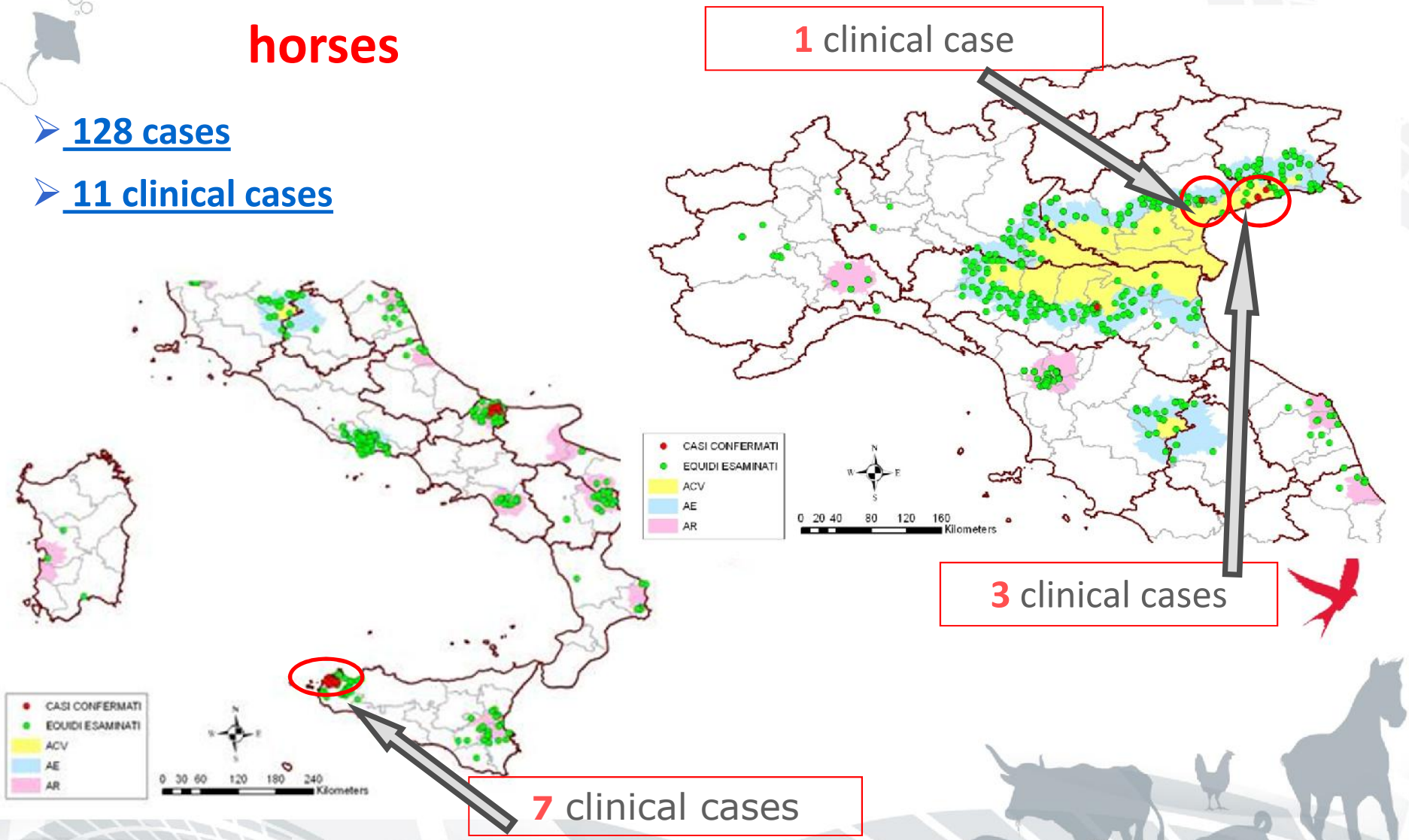
2010

Surveillance on horses

- 128 cases
- 11 clinical cases



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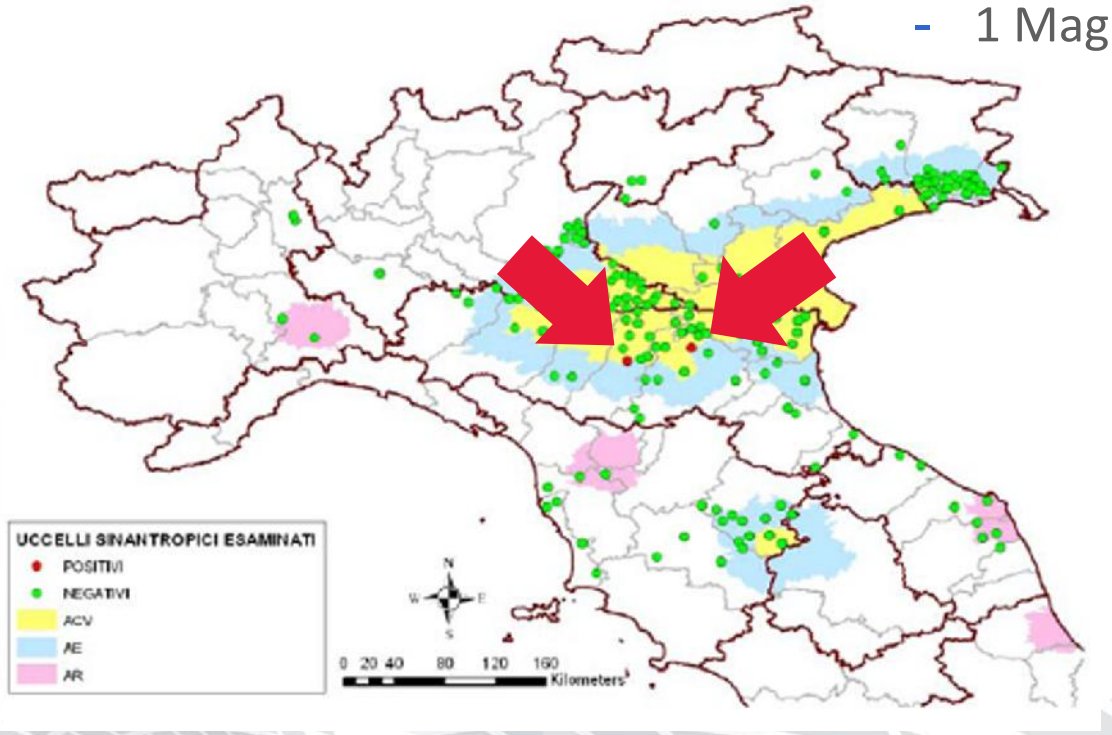
Surveillance on residential birds

- **2 PCR positive results on:**
  - 1 Eurasian Jay (*Garrulus glandarius*)
  - 1 Magpie (*Pica pica*)



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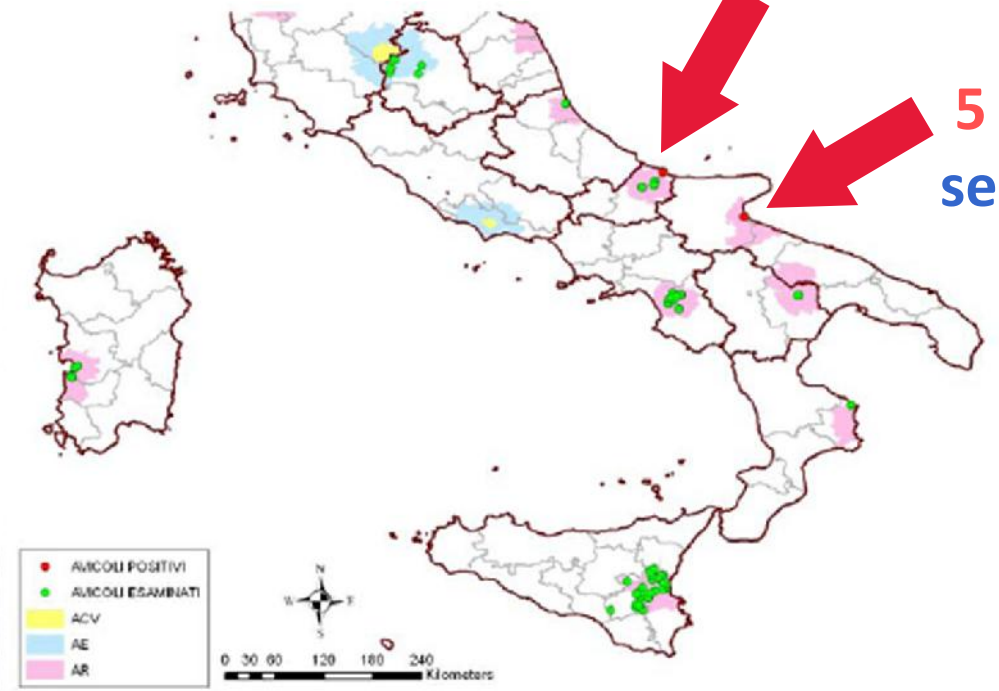
2010

Sentinel chickens

3 sentinel chickens PCR positive

5 sentinel chickens seroconverted



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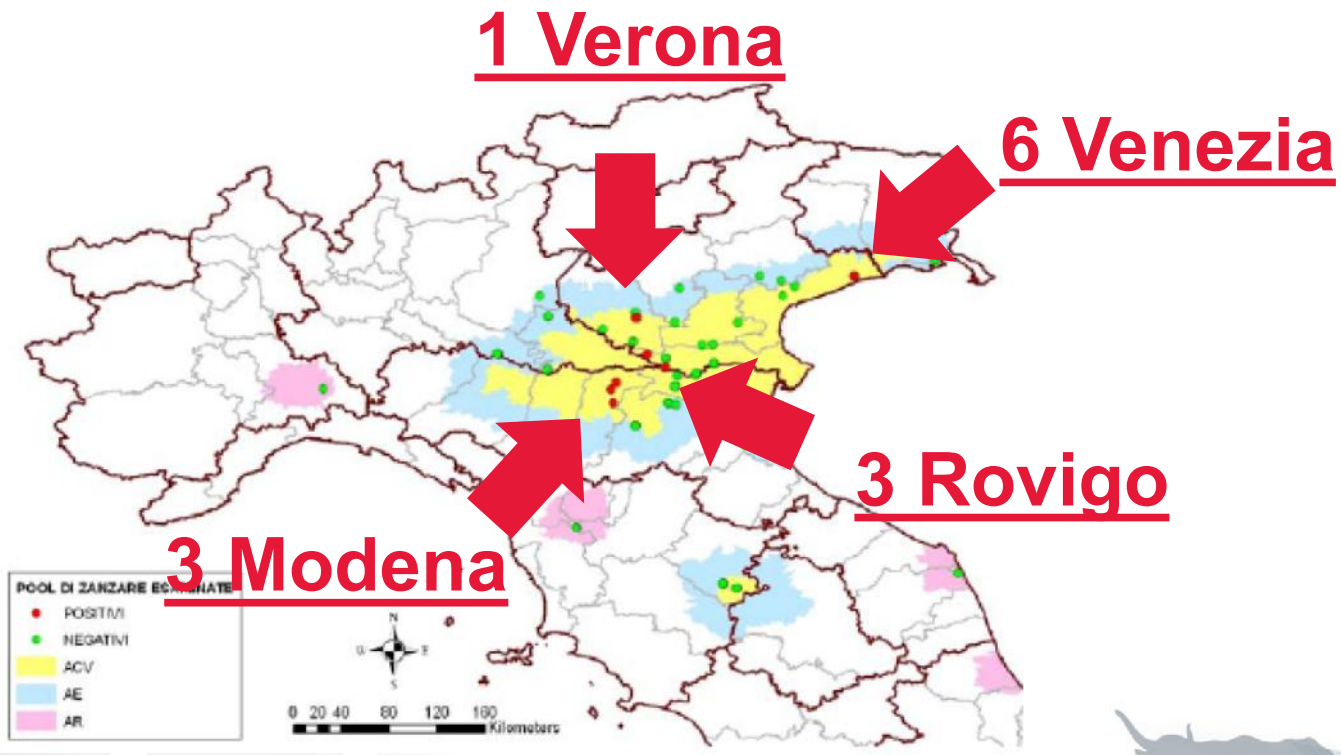
2010

Entomological surveillance

- 13 PCR positive mosquito pools



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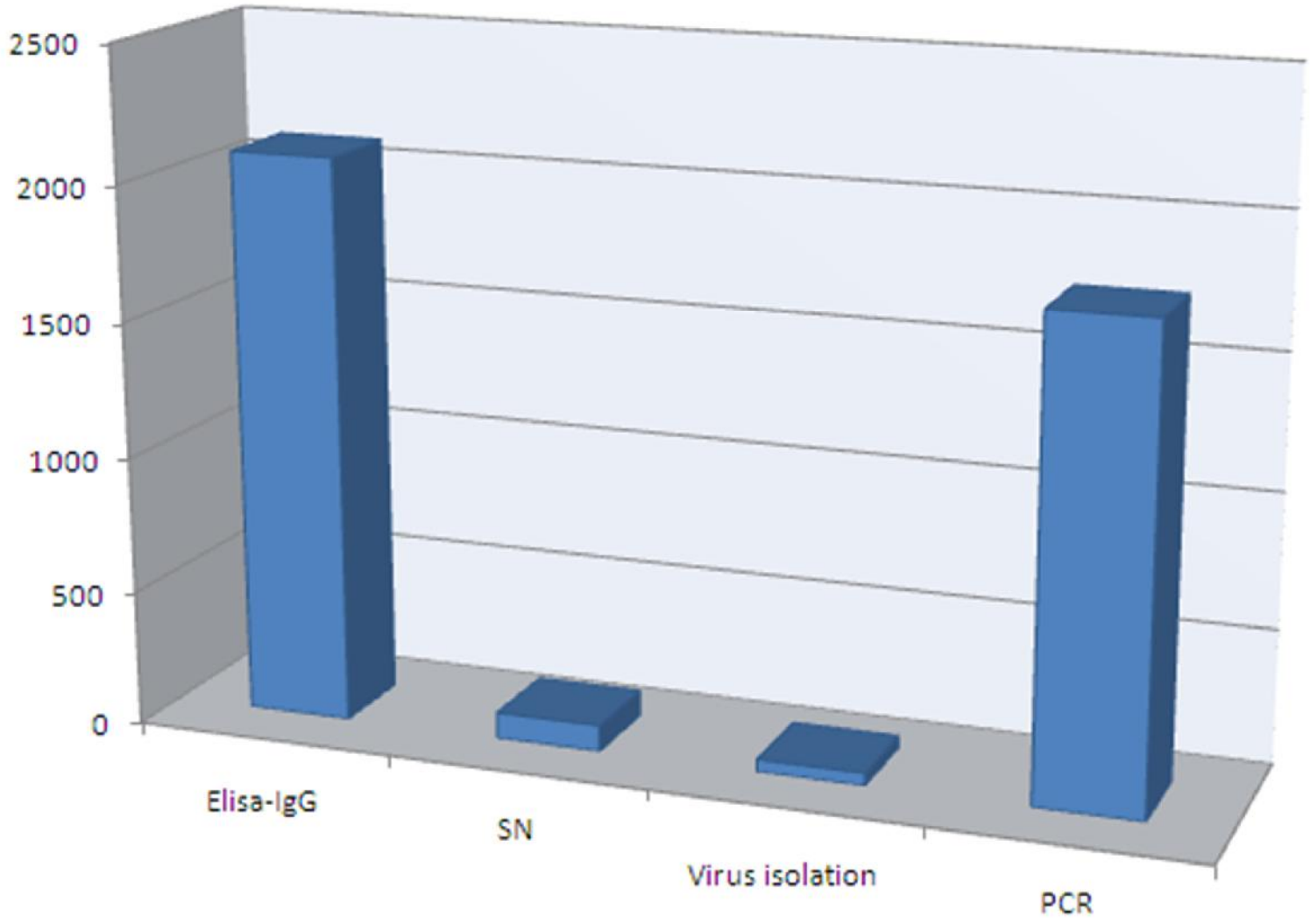
2010 – No. of tests Sentinel Chicken



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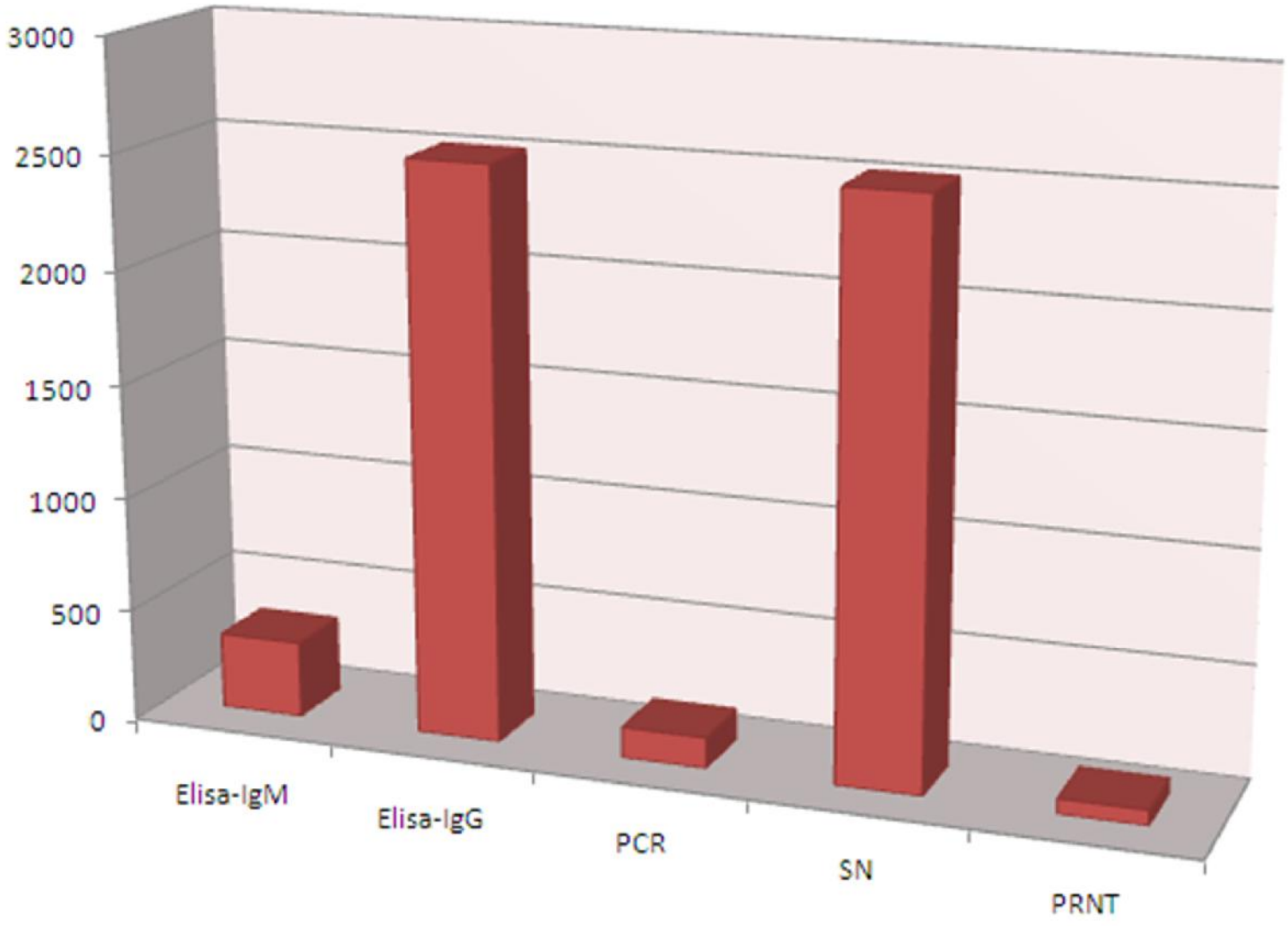
2010 – No. of tests Sentinel Horses



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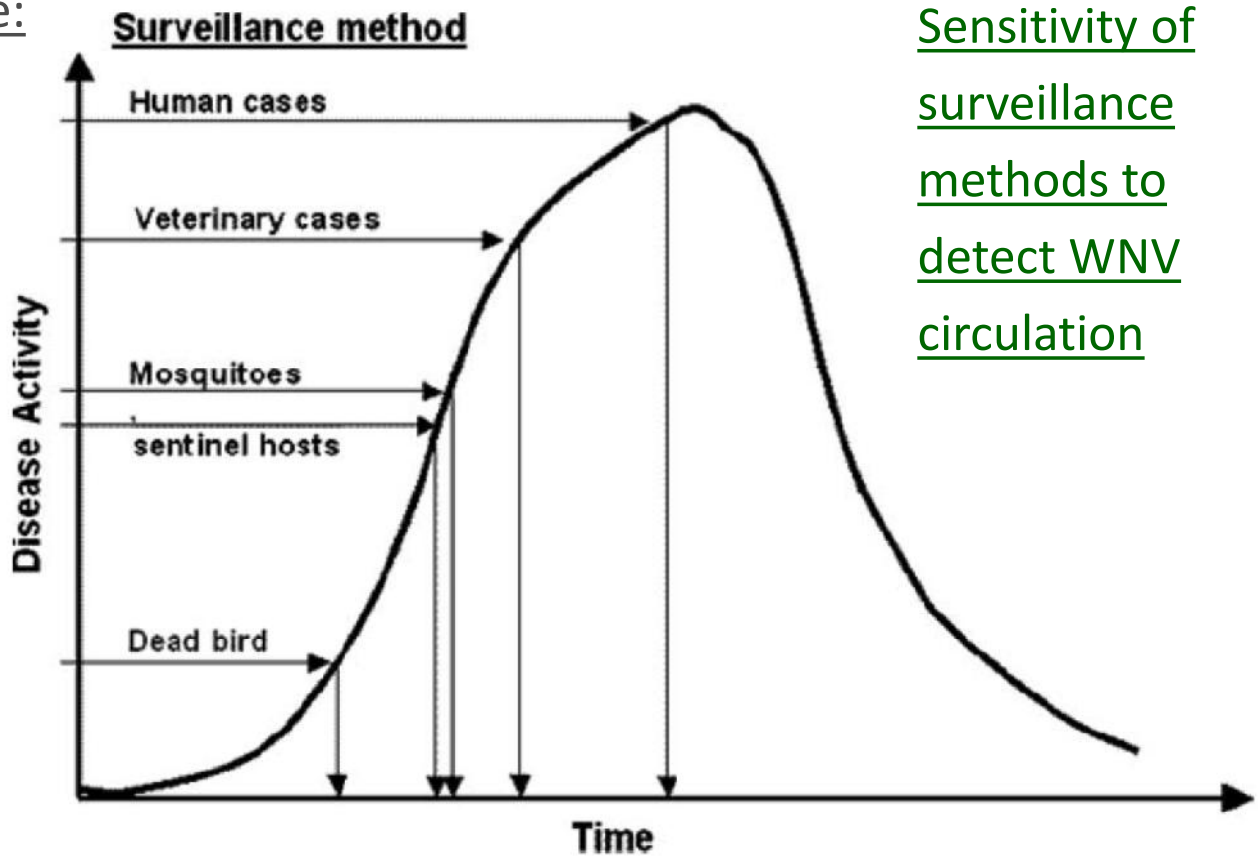
WND surveillance

- Multi-host surveillance:
  - ✓ Birds
  - ✓ Mosquitoes
  - ✓ Men
  - ✓ Horses



Sensitivity of surveillance methods to detect WNV circulation

G. Dauphin *et al.* Comp. Immun. Microbiol. Infect. Dis. 27 (2004) 343–355

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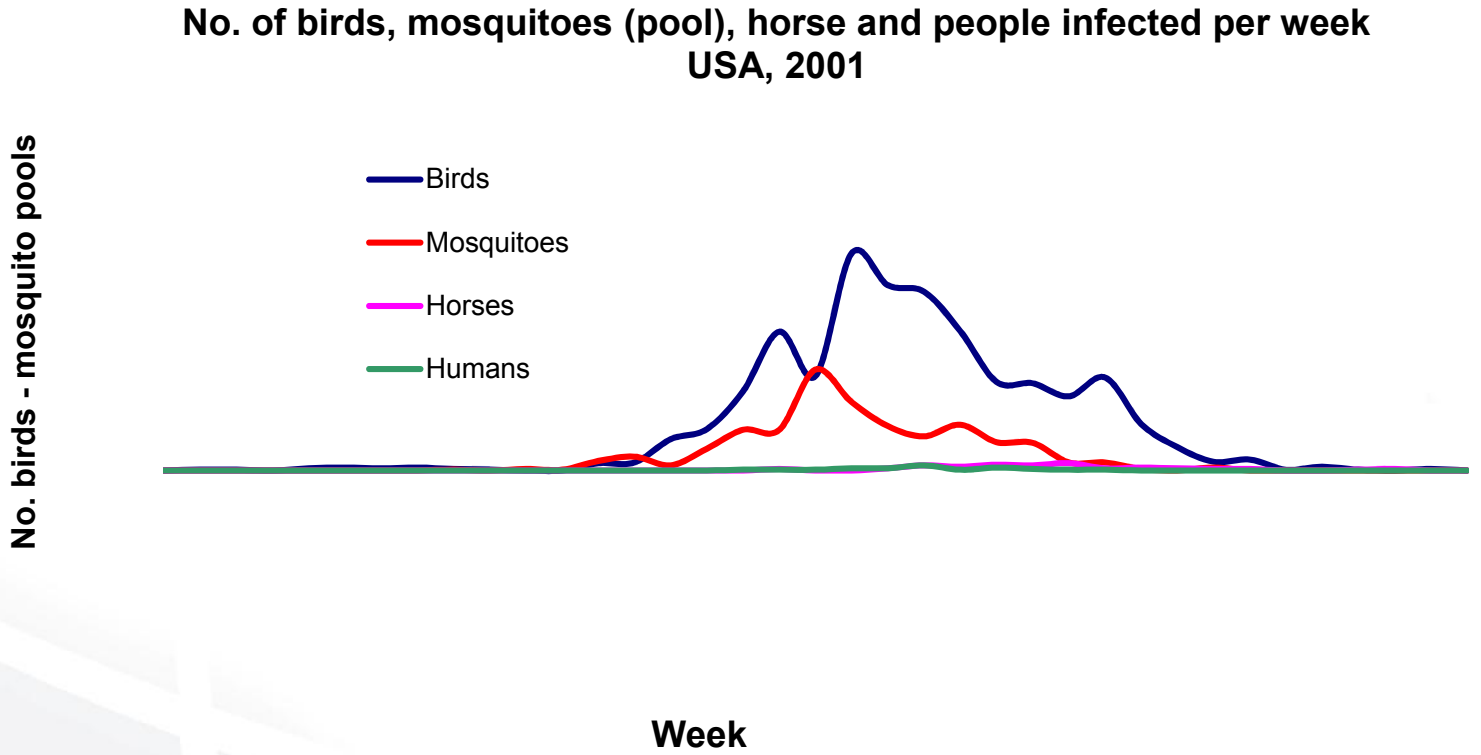
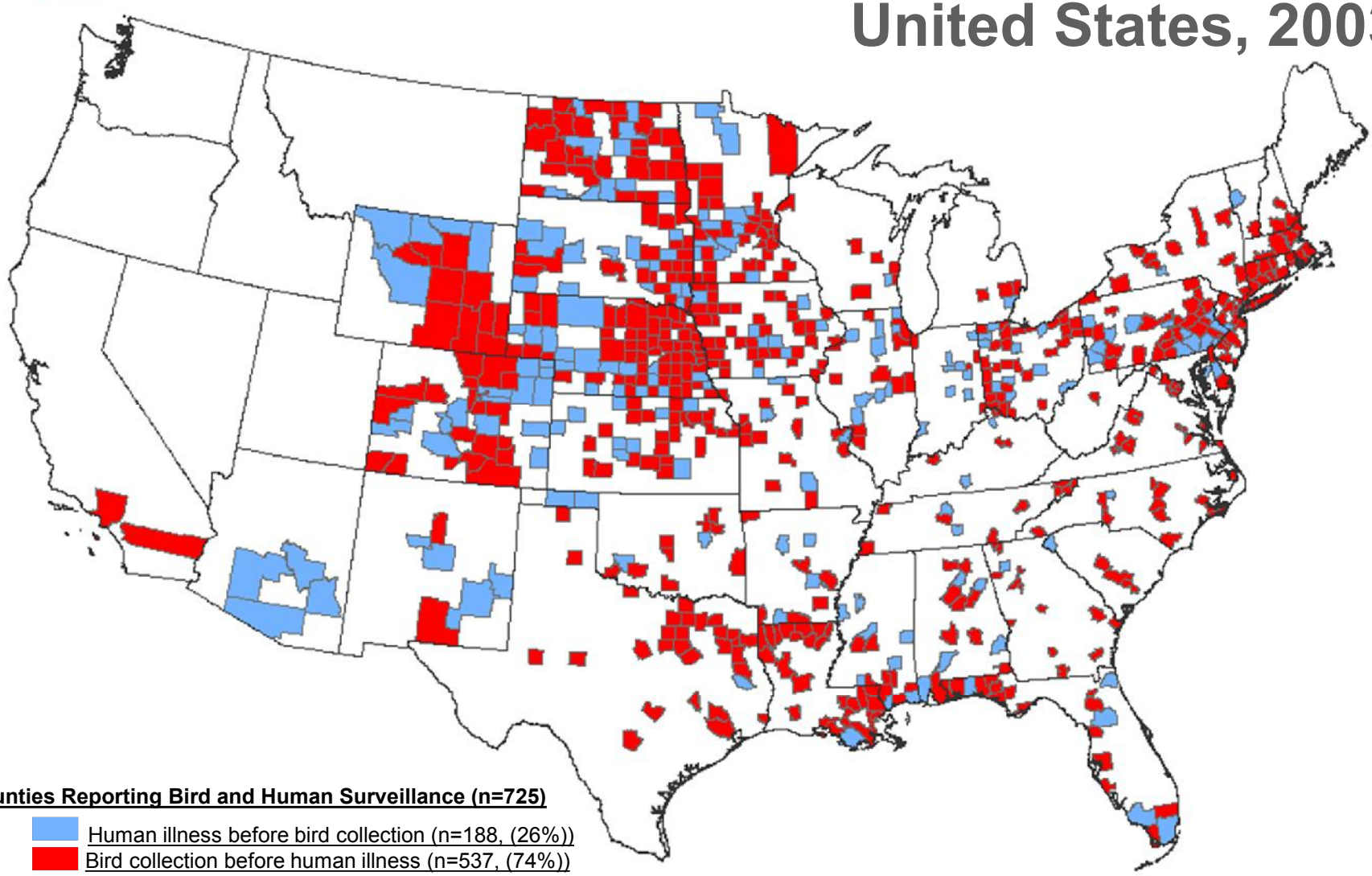
Progression of infection in different hosts

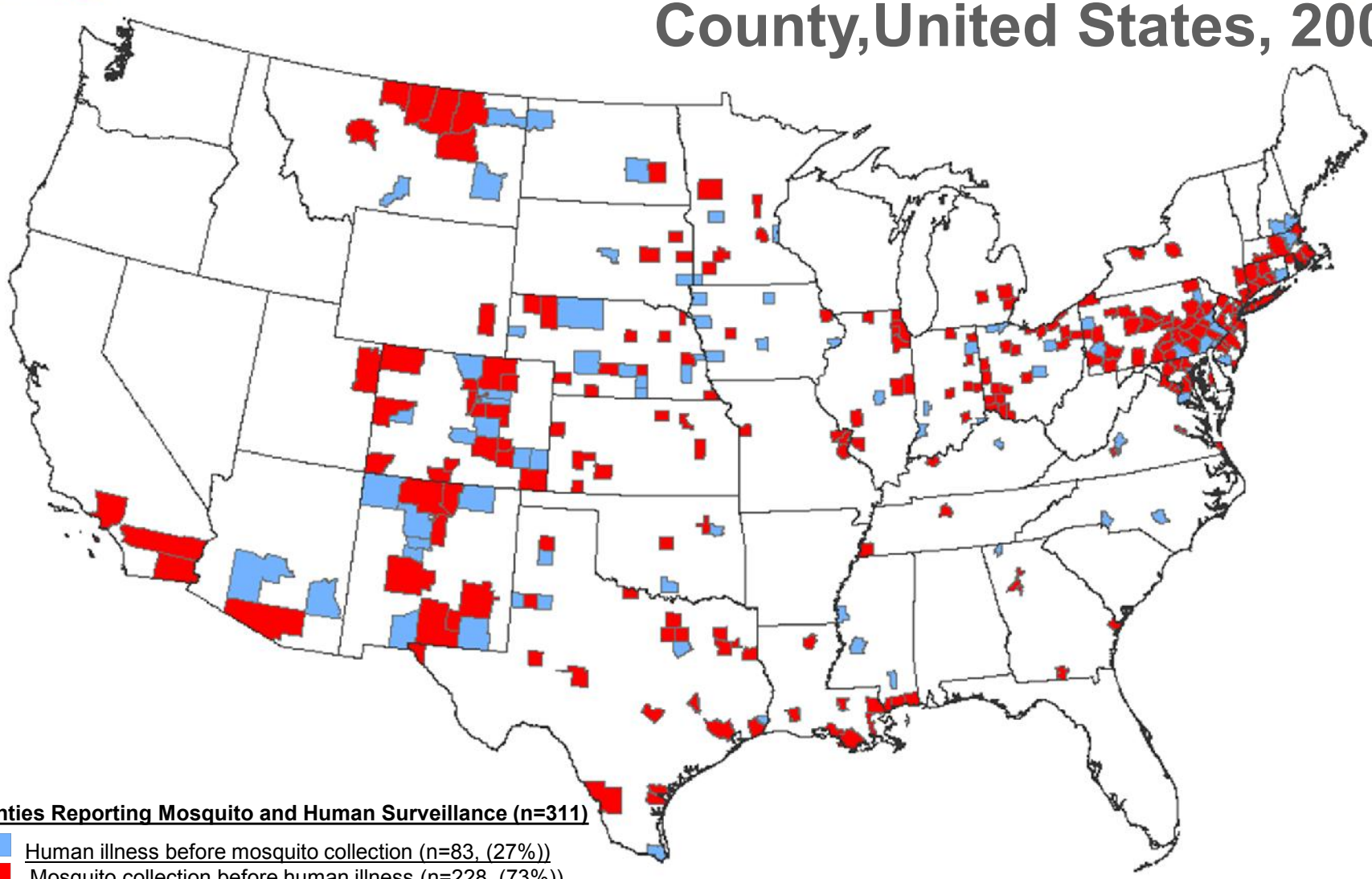


Timing of WNV-Positive Dead Bird Collection and Human WNV Case Onset, By County, United States, 2003



Carolyn Reimann (CDC), 2007

Timing of WNV-Positive Mosquito Pool Collection and Human WNV Case Onset, By County,United States, 2003



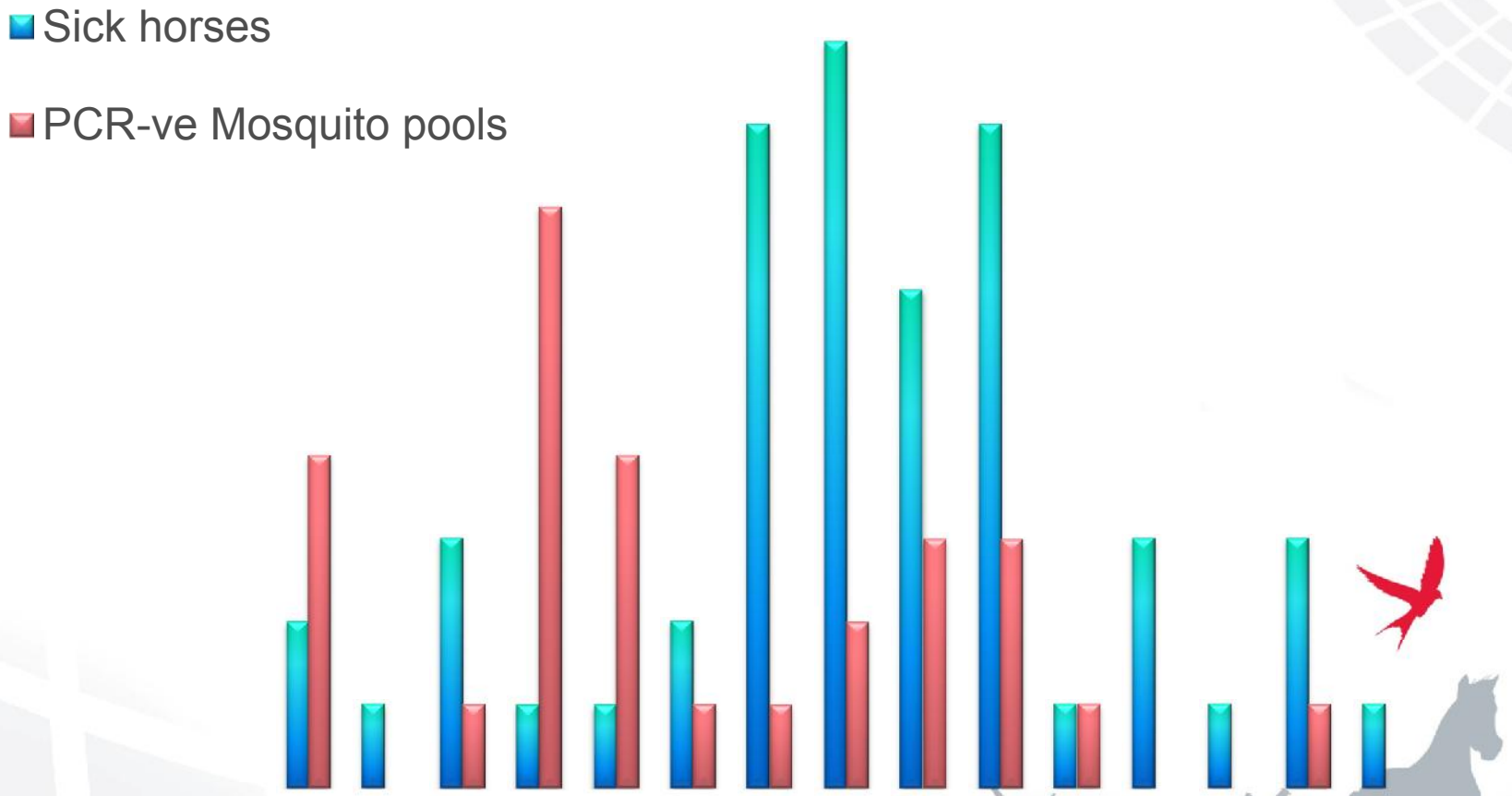
Counties Reporting Mosquito and Human Surveillance (n=311)

Human illness before mosquito collection (n=83, (27%))

Mosquito collection before human illness (n=228, (73%))

Carolyn Reimann (CDC), 2007

Timing of PCR-positive mosquitoes pools vs horses clinical cases onset – Italy 2009



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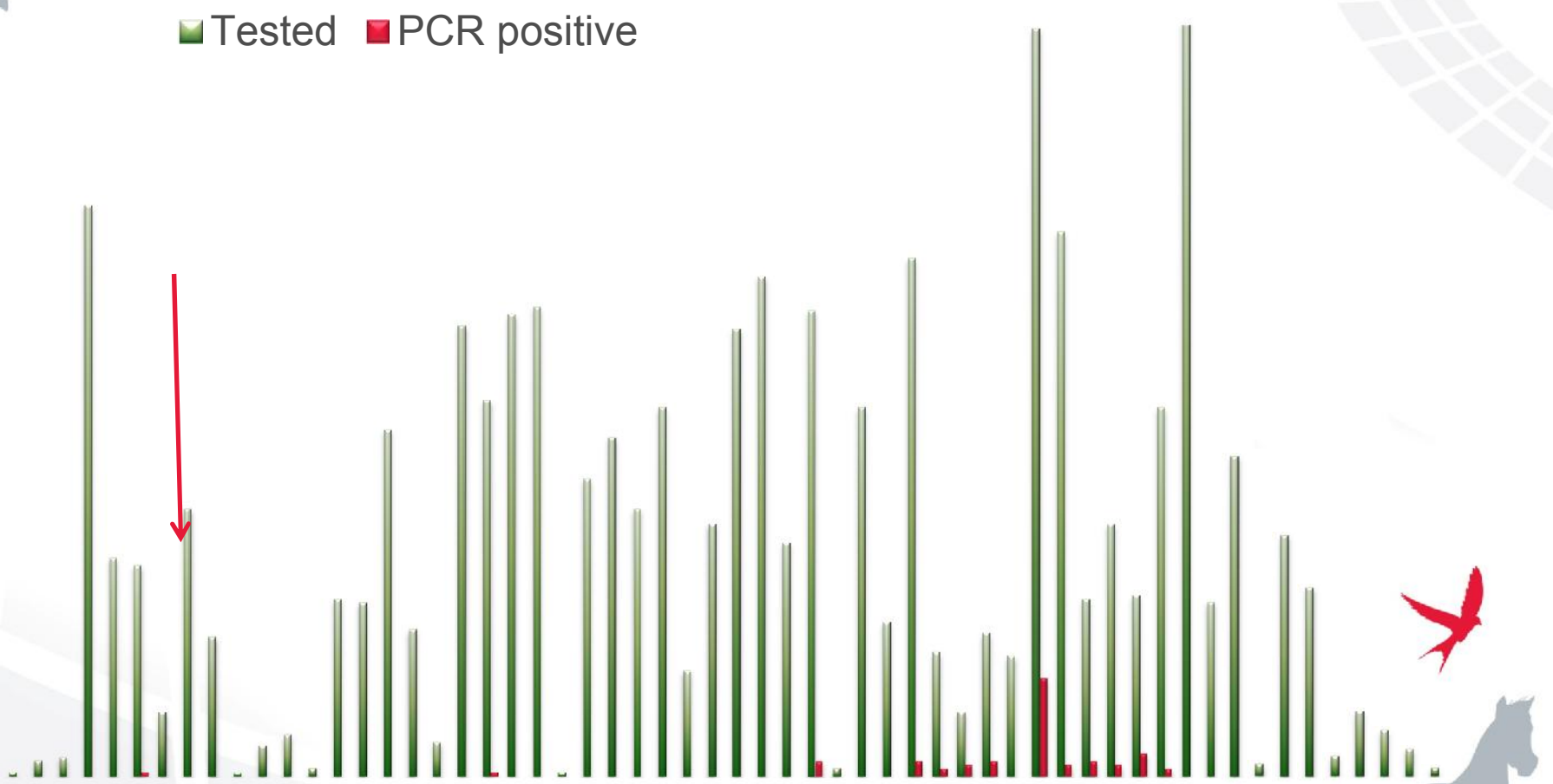
Birds tested and positive - Italy (2008-2009)



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Data collection and dissemination

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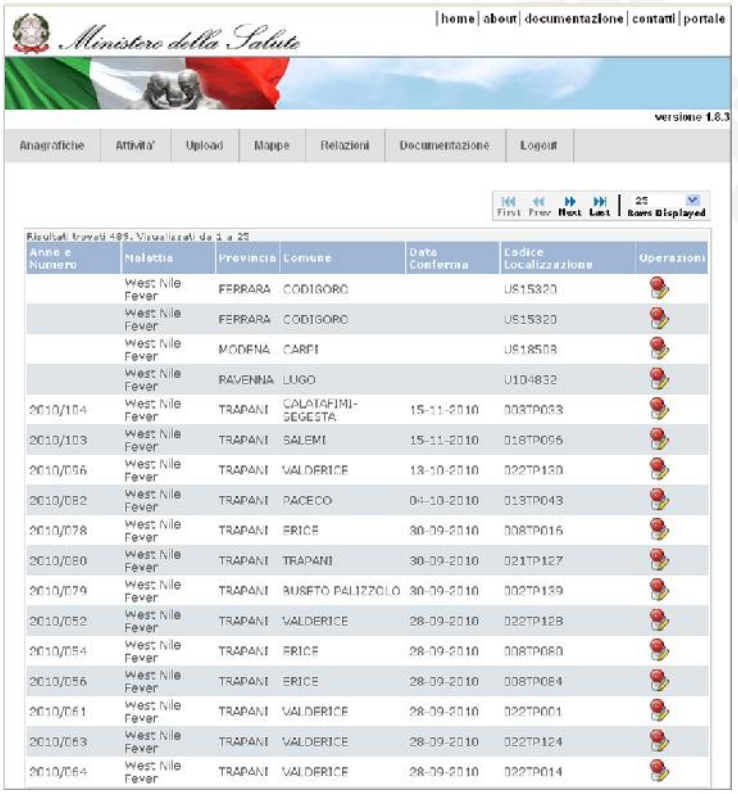
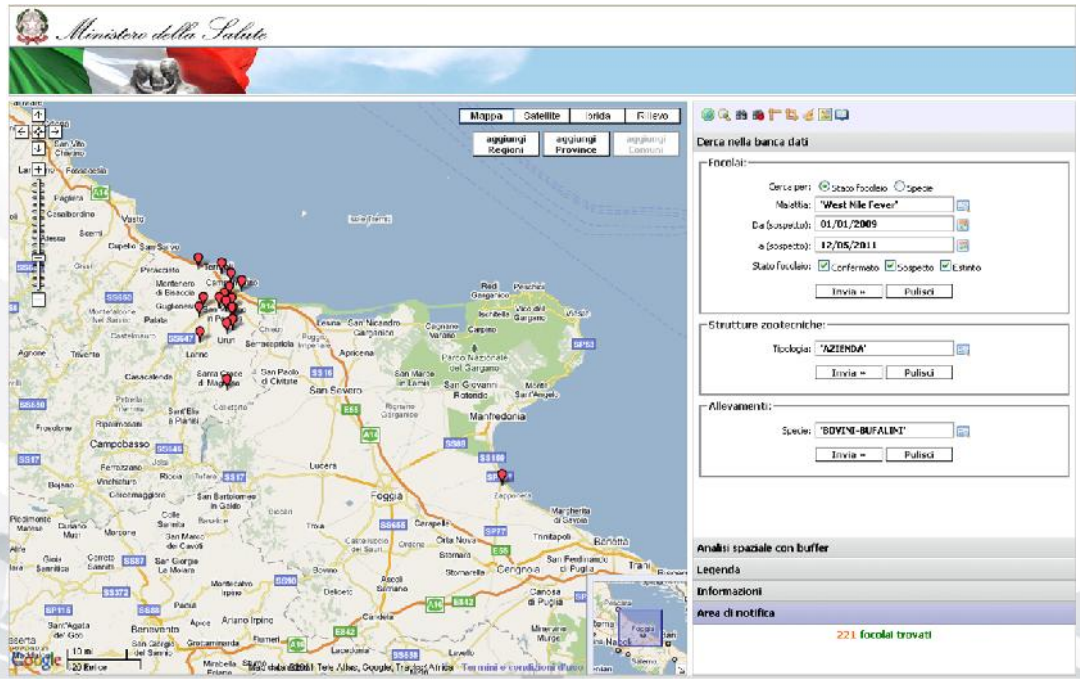
The National Veterinary Information System

https://www.vetinfo.sanita.it/

Outbreak and diagnostic activities registration





WND Info Homepage

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Piano di sorveglianza nazionale per la West Nile Disease

- Descrizione della malattia
- Brochure informativa
- Bollettino Epidemiologico 2008
- Bollettino Epidemiologico 2009
- Bollettino Epidemiologico 2010
- Riferimenti legislativi
- Scheda di indagine epidemiologica
- Sistema Informativo Emergenze
- Registrazione in BDN dei dati anagrafici degli animali (equidi,polli/anatidi) sentinella
- Stampa Modelli
- Come fare a...
- Pubblicazioni
- Progetto Eden
- Contattaci

West Nile Disease nel Bacino del Mediterraneo

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CESME

http://sorveglianza.izs.it/emergenze/west_nile/emergenze.htm

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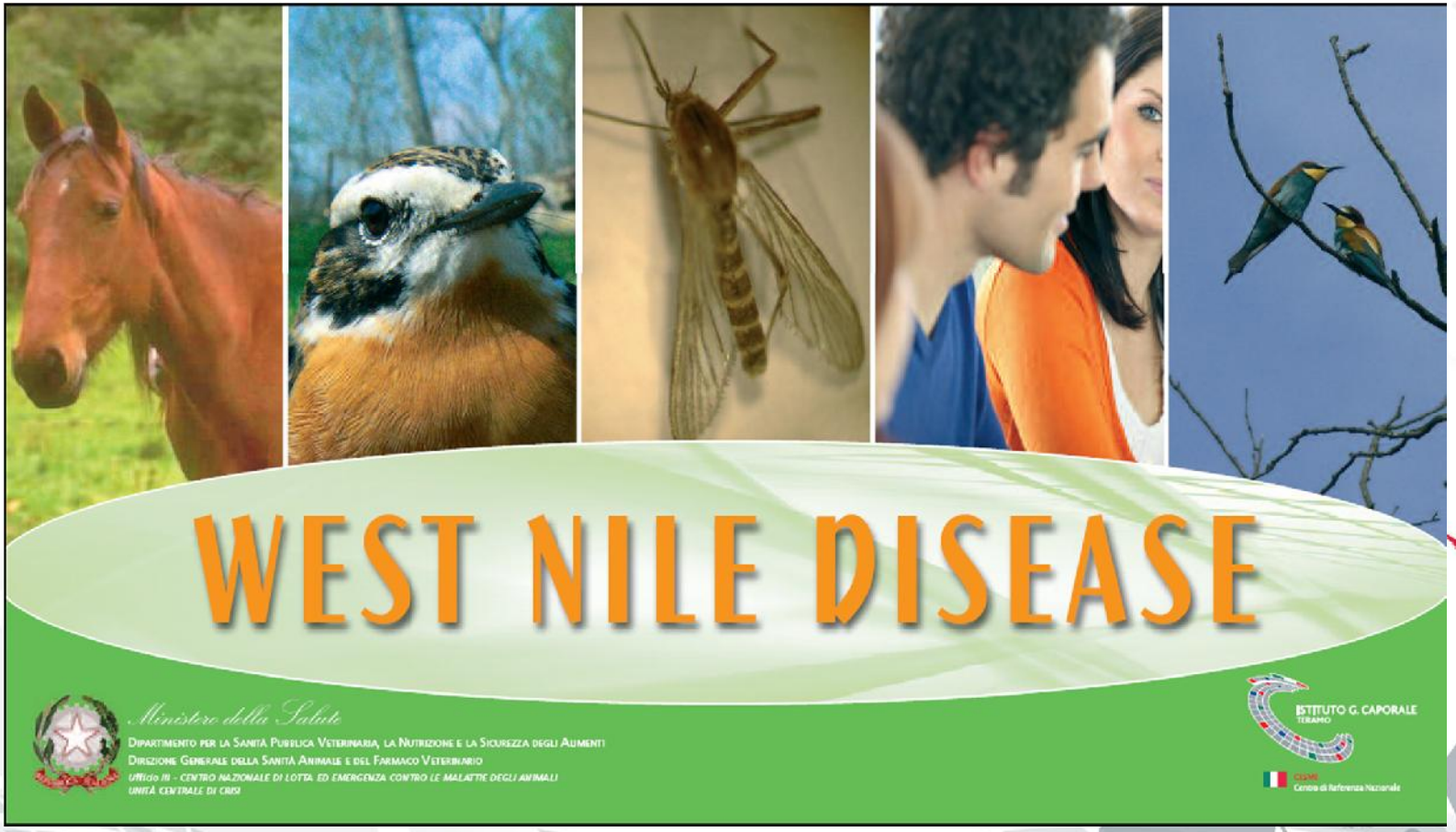
Leaflet



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National Veterinary Epidemiological Bulletin

Giugno 2010 pdf Numeri precedenti Suggerimenti

BENV
Bollettino Epidemiologico Nazionale Veterinario

Giugno 2010 In questi mesi Dati Mappe Intorno a noi

Bollettino Epidemiologico Nazionale Veterinario

Uno strumento per la diffusione dell'informazione

La messa a punto di un sistema informativo nazionale per la notifica delle malattie infettive negli animali (SIMAN) costituisce una preziosa fonte di informazioni epidemiologiche su quanto accade nel nostro Paese.

Dopo un periodo di sperimentazione, attualmente più di 450 utenti, veterinari dei servizi veterinari delle AUSL e delle Regioni, sono registrati nel SIMAN, a testimonianza dell'interesse per tale strumento epidemiologico.

Il sistema SIMAN è oggi arricchito da alcuni strumenti per la visualizzazione ed analisi dei dati dei focolai, come ad esempio il sistema WEB-GIS tramite il quale è possibile interrogare i

In tale contesto il COVEPI ha predisposto la redazione di questo Bollettino Epidemiologico Nazionale Veterinario (BENV), che riprende la propria pubblicazione dopo anni di silenzio.

Il BENV avrà cadenza trimestrale ed è rivolto a tutti gli operatori del SSN. La possibilità di conoscere, infatti, la situazione epidemiologica aggiornata in Italia e nei Paesi a noi geograficamente vicini, è indispensabile non solo per il lavoro dei medici veterinari operanti all'interno del SSN, ma anche, nel caso delle zoonosi, per i medici e per le altre figure professionali dei Dipartimenti di prevenzione.

Si invitano tutti ad inviare commenti e **suggerimenti** per

http://www.izs.it/BENV/home.html

Focolai di Bluetongue

Distribuzione geografica dei focolai notificata nel I semestre 2010

Focolai di Malattia Vescicolare

Distribuzione geografica dei focolai notificata nel I semestre 2010

Focolai di Influenza Aviaria, bassa patogenicità

Distribuzione geografica dei focolai notificata nel I semestre 2010

Focolai di Peste Suina Africana

Distribuzione geografica dei focolai notificata nel I semestre 2010

Dati alla mano

Focolai Denunciati in Italia
Focolai Denunciati per Regione
Stato Sanitario

Focolai denunciati in Italia

Primo semestre 2010

NUMERO DI FOCOLAI DI MALATTIE INFETTIVE DEGLI ANIMALI NOTIFICATI NEL SISTEMA INFORMATIVO MALATTIE ANIMALI NAZIONALE (SIMAN) DAL 01/01/2010 AL 30/06/2010

MALATTIA	MESE					
	Gennaio	Febbraio	Marzo	Aprile	Maggio	Giugno
Agalassia contagiosa degli ovini e dei caprini	7	10	5	8	6	4
Anemia infettiva degli equini	2	7	9	13	21	10
Artrite / encefalite delle capre (CAE)	2	1	0	0	0	0
Brucellosi nei bovini, dei bufalini, degli ovini, dei caprini e dei suini	31	42	55	54	58	43
Clamidiosi ovina - Aborto enzootico	2	0	0	0	0	0
Febbre Catarrale degli ovini (Bluetongue)	0	6	4	3	1	3
Influenza Aviaria - Bassa patogenicità nel pollame	2	0	0	3	0	0
Leucosi bovina enzootica	0	0	1	0	1	1
Mal rossino	0	0	0	1	0	0
Malattia Vesicolare	2	0	0	0	0	0
Mastite catarrale contagiosa dei bovini	0	0	0	0	3	2
Paratubercolosi	2	1	0	1	0	0
Pasteurellosi dei bovini, dei bufalini (barbone), dei suini e degli ovini	0	0	0	1	0	0
Peste Suina Africana	0	0	3	5	1	0
Peste europea	0	0	0	0	1	0
Psittacosi - clamydiosi aviare	0	0	2	0	0	0
Rabbia	50	36	45	43	15	9
Rinopolmonite	0	1	1	0	0	0
Salmonellosi aviarie non tifoidee	2	0	3	2	0	0
Salmonellosi ovina	7	3	0	0	0	0
Scrapie	0	2	0	5	4	2
Setticemia emorragica virale	0	0	2	1	0	0
Tubercolosi Bovina	12	12	19	21	14	16

Training of veterinary officials and private practitioners

- Need to rapidly disseminate crucial information to many people
- Training has a strategic role on the efficacy of surveillance and control measures

- E-Learning technologies are the best option for these purposes

WND training

- August 2008: occurrence of first WND case
- After 40 days a training course on **recognition, diagnosis and control of WND** was on-line
- During 4 months **453 official veterinarians** attended the course


Thank you