

IZS

T E R A M O

/

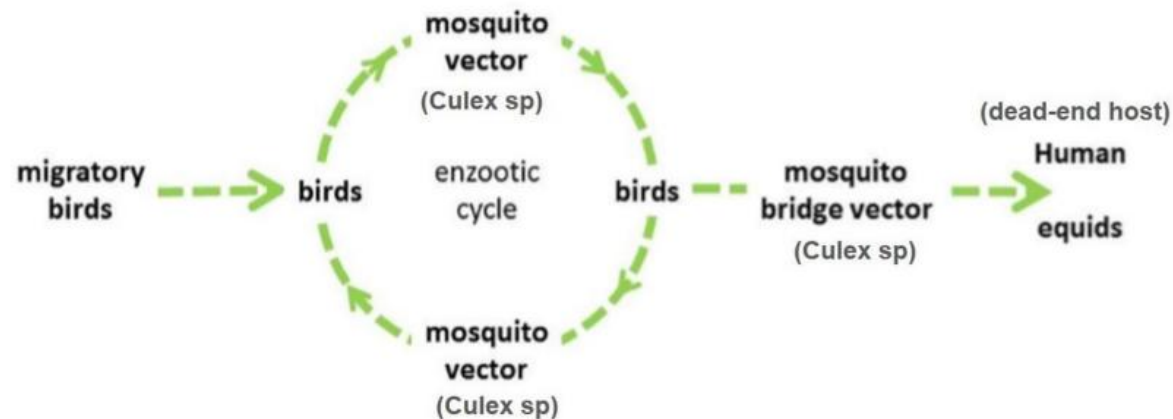
ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPORALE"

WNV Surveillance System in Italy

WOAH Regional Seminar
Vector-Borne Diseases in the European Region
25 - 27 June 2025

Daniela Morelli (CESME) / Laura Amato (COVEPI)
Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale"

WNV cycle



West Nile virus (WNV) is a zoonotic arbovirus maintained and amplified in nature in an enzootic cycle between **birds** and **mosquitoes**.

Humans, horses, and other mammals represent dead-end hosts.

IZS

TERAMO

/

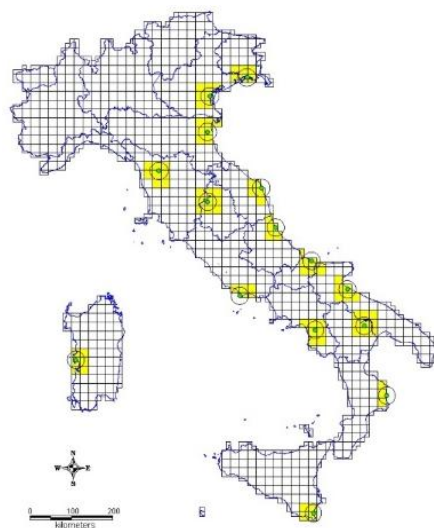
ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPOREALE"

WNV surveillance: the Italian model



WNV surveillance: the Italian model

1998 – First outbreak in Tuscany
(Padule di Fucecchio):
14 horses with neurological
symptoms (in one location), but
no human clinical cases



2001 – a **multi-species** surveillance plan
including **wild birds, resident birds, poultry,**
horses and **mosquitoes** was in place

- **To early detect** WNV introduction/circulation
and
- To monitor the spread of the infection.

2002-2013

Goal : detect the introduction and local spread of WNV

Fifteen WNV-at-risk areas were selected according to their **suitable eco-climatic conditions** and monitored by using an approach based on **serological screening in sentinel animals (horses and poultry), wild bird mortality, and mosquito surveillance.**

2008 - WNV was identified in **mosquitoes, birds, horses and humans** in the area surrounding the Po river delta



IZS

T E R A M O

/

ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPORALE"

WNV 2008-2024



Since then, WNV epidemics have been registered every year.
To date, most (18/20) of Italian regions are considered at high risk of transmission.

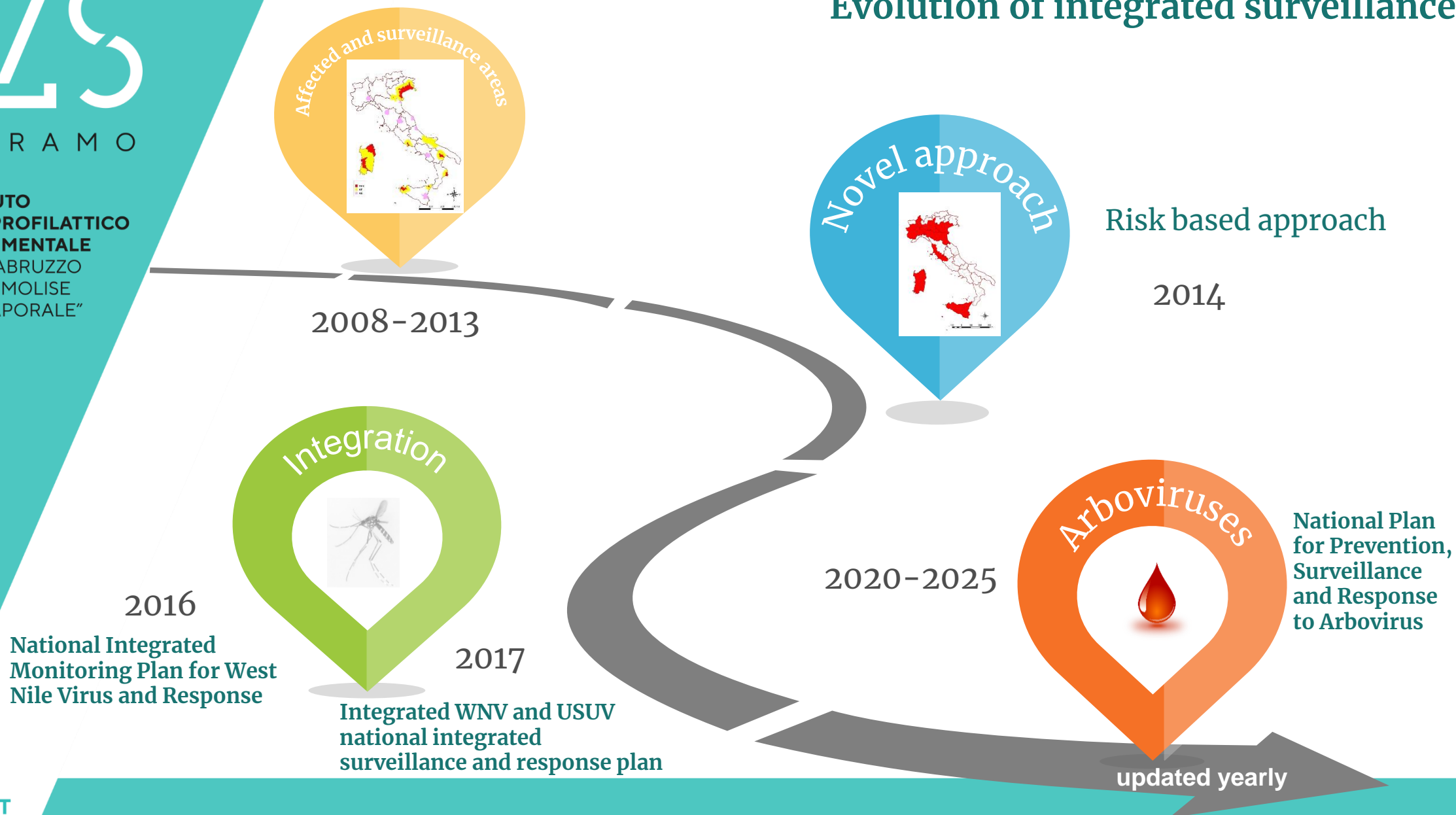
IZS

T E R A M O

/

ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPOREALE"

Evolution of integrated surveillance



WNV and Usuv surveillance: the Italian model

2020

- WNV and USUV surveillance are included in the **National Plan for Prevention, Surveillance and Response to Arboviruses – 2020–2025 (PNA)**.
- The PNA integrates in a unique document the **prevention, surveillance and intervention measures** to be implemented at the national level for autochthonous and imported arboviruses.
- Promote a collaborative, multisectoral, and multidisciplinary approach working at the local, regional, national and global levels.
- Recognize the interconnection between people, animals, plants, and their shared environment **(One Health approach)**.



Piano Nazionale di prevenzione, sorveglianza e risposta alle Arbovirosi (PNA) 2020-2025

Integrazione della prevenzione, sorveglianza e risposta alle arbovirosi in altre politiche: tale capitolo permette una visione più ampia delle problematiche relative alle arbovirosi, individuando sia i documenti prodotti dal Ministero della Salute, sia le strategie implementate da altre amministrazioni, con particolare riferimento al Ministero dell'Ambiente e della Tutela del Territorio e del Mare, all'Istituto Superiore di Sanità, all'Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale" e alla rete degli Istituti Zooprofilattici Sperimentali, all'Istituto Superiore per la Protezione e la Ricerca Ambientale, alla Rete Città Sane dell'OMS e al Ministero dell'Istruzione dell'Università e della Ricerca, con cui è possibile attivare sinergie e promuovere interventi congiunti.

Prevenzione: individua i principali interventi di prevenzione da attuare per tutte le arbovirosi oggetto del Piano, suddividendoli in: comunicazione del rischio, formazione, misure ambientali, misure di contrasto ai vettori, vaccinazione, raccomandazioni organizzative.

Sorveglianza e risposta ai virus West Nile e Usutu: aggiorna le indicazioni fornite con la circolare ministeriale n. 10381 del 05 aprile 2019.

Sorveglianza e risposta alle arbovirosi trasmesse da zanzare invasive (Aedes sp.) con particolare riferimento ai virus Chikungunya, Dengue e Zika: aggiorna le indicazioni fornite con la circolare ministeriale n. 6036 del 27 febbraio 2019.

Sorveglianza e risposta al virus dell'encefalite virale da zecche, Toscana e ad altri arbovirus non sottoposti a specifici interventi di sorveglianza e risposta: aggiorna ed amplia le indicazioni fornite con la circolare ministeriale n. 6036 del 27 febbraio 2019.

Sorveglianza di nuove specie invasive, potenziali vettori: istituisce la sorveglianza delle zanzare invasive a livello nazionale integrando le indicazioni fornite dalla Linea guida per l'identificazione e la sorveglianza dei siti a rischio di introduzione prodotte nell'ambito del progetto CCM 2014 "Prevenzione delle malattie a trasmissione vettoriale: sviluppo e implementazione pilota di strumenti di supporto" con i provvedimenti normativi nazionali ed internazionali vigenti in materia di specie invasive.

Monitoraggio della resistenza agli insetticidi: fornisce indicazioni per attivare, nell'arco temporale coperto dal PNA, tale monitoraggio.

Indicazioni temporali sull'implementazione del PNA e valutazione: fornisce indicazioni sul tempo entro cui devono essere implementate le misure previste dal PNA ed include i criteri di valutazione che saranno adottati.

Risk-based classification of the Italian provinces

High transmission risk area

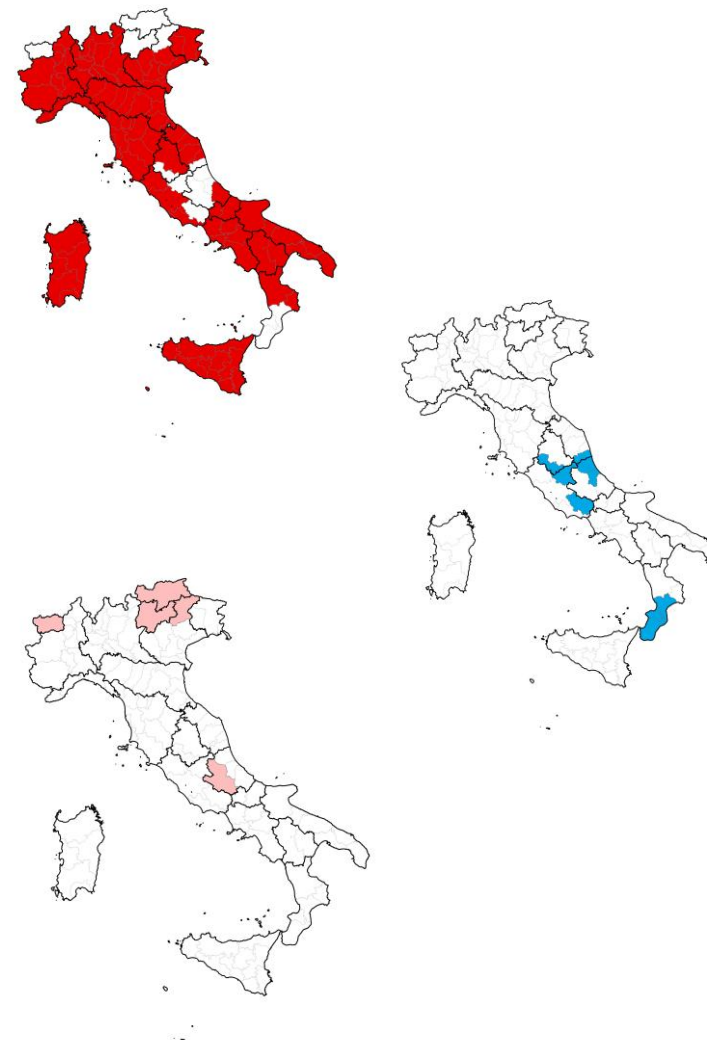
Territories (Provinces NUT-3) where WNV is circulating or has circulated in at least one of the 5 years before as well as the surrounding areas

Low transmission risk area

Territories (Provinces NUT-3) where WNV has never been/rarely reported, which have eco-climatic condition favorable to viral circulation

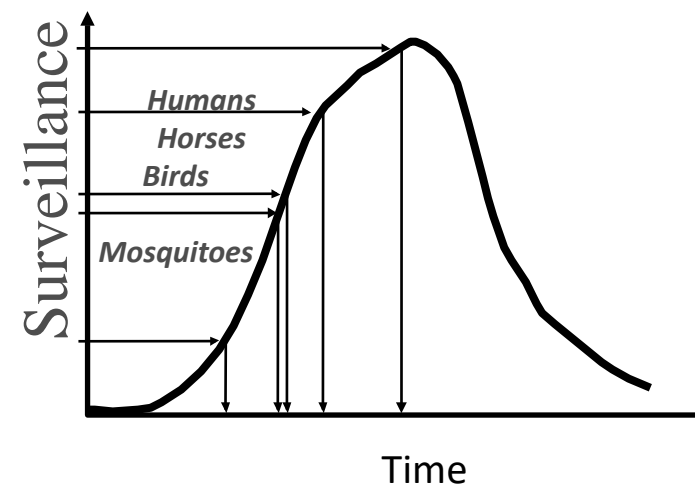
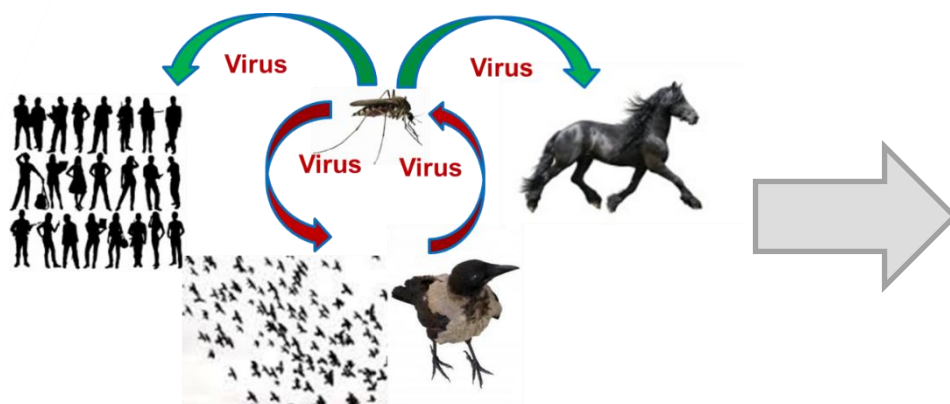
Minimum transmission risk area

Territories (Provinces NUT-3) where WNV has never been reported and where eco-climatic conditions are not suitable to WNV circulation



Veterinary Surveillance-SPECIFIC OBJECTIVES

- ✓ Identify WNV circulation as early as possible to allow rapid risk assessment
- ✓ Implement in a timely, effective and coordinated manner the preventive measures necessary to reduce the risk of transmitting the infection to people



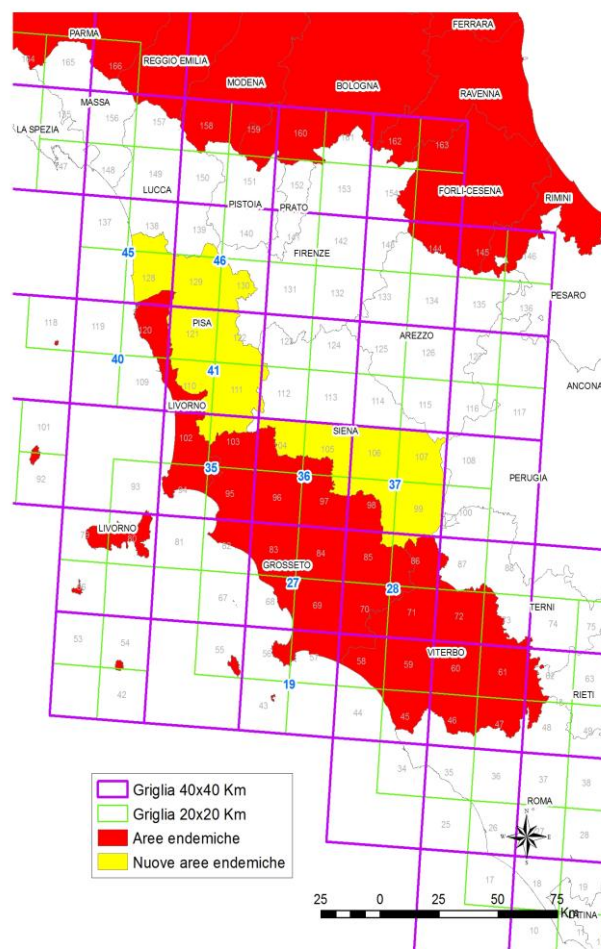
WNV surveillance: the Italian model

Veterinary surveillance activities are focused on:

1. Surveillance of resident birds of target species in **High** and **Low risk** areas
2. Entomological surveillance in **High** and **Low risk** areas
3. Horses clinical surveillance (**whole country, all year**)
4. Wild birds mortality surveillance (**whole country, all year**)



WNV surveillance: the Italian model



40x40 km grid for
surveillance on resident
birds belong to target
species

20x20 km grid for
entomological
surveillance

WNV surveillance: the Italian model

1. Surveillance on resident birds (target species)

In **HR** and **LR** areas at least 100 individuals/units belonging to the target species have to be collected and tested from **April to November**.

Sampling size: 100 birds /1200-1600km²

Target species:

- **Magpie**
- **Carrion Crow**
- **Eurasian jay**



WNV surveillance: the Italian model

2. Entomological surveillance

- The local Veterinary Services coordinate the entomological surveillance active in **HR** and **LR** areas to **evaluate the presence and abundance of competent vectors and WNV circulation.**
 - Collections are performed between **April to November** twice a month with CO₂-CDC or Gravid traps
 - at least **one trap/20X20 km** grid involved the territory 600 meters below the sea level.
- In **LR** area entomological surveillance has to be focused in areas where eco climatic conditions are suitable for WNV circulation between birds and mosquitoes.



WNV surveillance: the Italian model

3. Horses syndromic surveillance

Passive/clinical surveillance of horses is in place in the whole Country regardless the risk category of the area, all year round but particularly during the period of vector activity.

It is carried out by registering any episode of neurological syndromes in horses. Typical symptoms of WND in horses are considered:

- *weakness of the hind limbs;*
- *inability to maintain quadrupedal stance;*
- *paralysis/paresis of limbs;*
- *muscle twitching;*
- *proprioceptive deficits;*
- *blindness;*
- *ptosis of the lower lip or paresis of the labial or facial muscles;*
- *tooth grinding.*



4. Wild bird mortality surveillance

Wild bird mortality surveillance (passive surveillance) is in place in the whole Country regardless the risk category of the area.

- It is carried out by registering any episode of wild bird mortality particularly during the period of vector activity.
- The activity involves the collaboration of veterinary services with recovery centers

WNV surveillance: the Italian model

Measures in place to limit human transmission

When the first case of WN (in birds, horses, or mosquitoes) is confirmed in a **new province:**

1. Results are **simultaneously** transmitted to local and national health authorities including the **National Italian Transplant Centre and National Italian Blood Centre**, which implements the screening of blood donors in the affected province.
2. Regional authorities promote **public awareness campaigns** in the infected areas to minimize the exposure to mosquitoes bites.
3. **Mosquitoes control** interventions are applied on local scale and their efficacy is monitored.

Official
veterinarian

Coordinated at the regional level

Implement surveillance activities in the field

Collect samples (bird, horse, mosquitoes)

Send samples to IIZZSS

In case of positive results, notify suspected
cases to SIMAN

In case of confirmation, notify confirmed
outbreaks in SIMAN

At regional level

IIZZSS

Test samples (bird, horse,
mosquitoes)

In case of positivity, send the
samples to CESME

In case of positivity, notify
the official veterinarian

At national level

CESME

Test the suspected samples

Verify the correctness of notifications in SIMAN

In case of confirmed results, reports the outbreak to the Ministry of
Health

In case of confirmed results, reports the outbreak to National Italian blood
Centre and National Italian transplant Centre

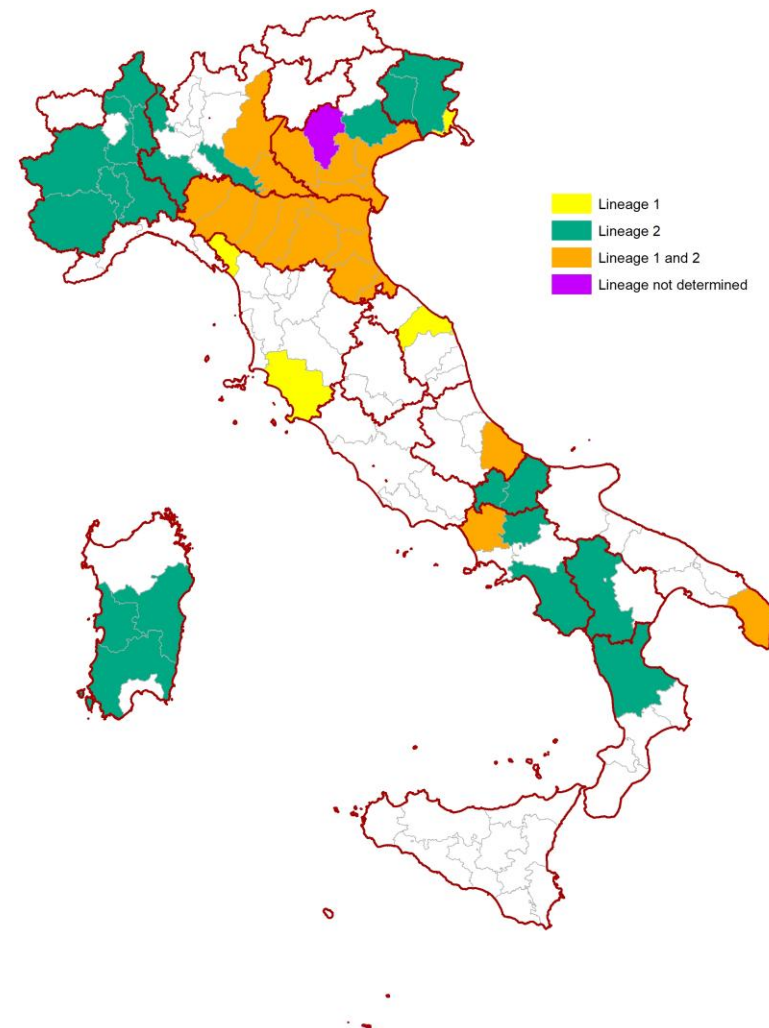
Disseminate the epidemiological situation on WNV



WNV numbers: the results of 2024 surveillance

WNV+ 2024

| | |
|---------------|-----------|
| Mosquitoes | 160 pools |
| Target birds | 204 |
| Wild birds | 228 |
| Equids | 46 |
| Humans (WNND) | 272 |



IZS

T E R A M O

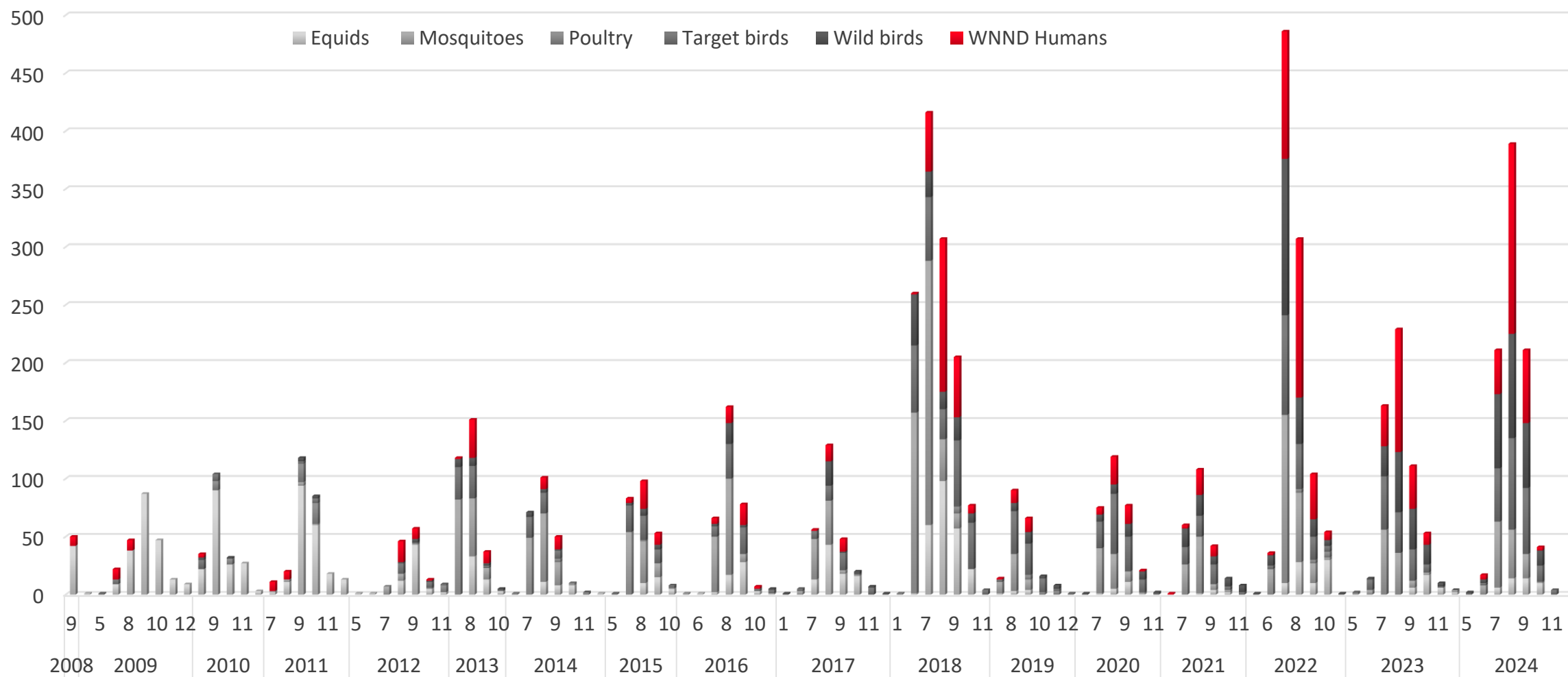
/

ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPORALE"

WNV numbers: the results of 2024 surveillance



Vector and animal and human cases 2008-2024



Communication and innovative tools

- Reports

National epidemiological bulletins and reports:

- Bulletins – disease trends for both veterinary and human areas, prepared weekly in collaboration with Istituto Superiore di Sanità (Italian National Institute of Health) and posted on the website, as well as disseminated via email.
- Epidemiological annual report – story maps, interactive approach



https://westnile.izs.it/j6_wnd/home



<https://storymaps.arcgis.com/collections/b50666024702441dac792d0cb3aee32c>



Communication and innovative tools

- Reports
- Dashboards

- (under development)
- report the activity performed by each region, and the outbreaks identified
- being created on a portal dedicated to veterinary services
- will assist in evaluating the progress of activities outlined in the plan

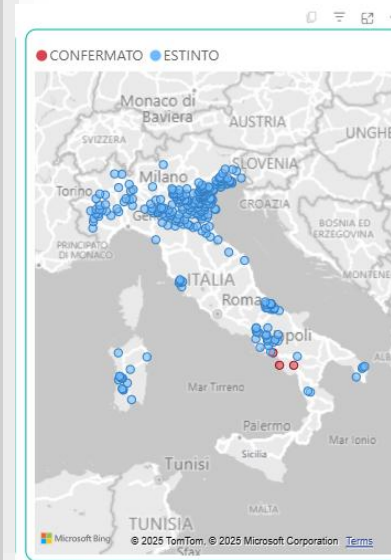
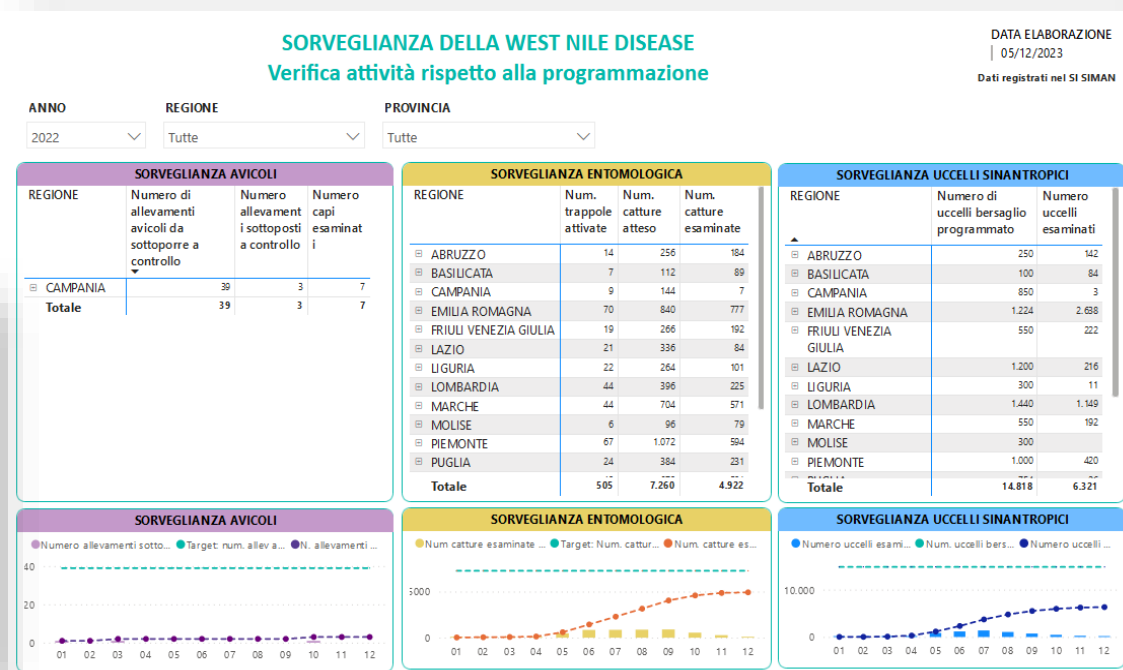
Home > Cruscotti sanità animale - West Nile Disease

Cruscotti sanità animale - West Nile Disease



Sorveglianza della West Nile Disease

Report



Conclusions

Due to complexity of the epidemiological cycle, surveillance of WNV circulation requires a **multidisciplinary effort**

Entomological and veterinary surveillance are keys:

- **to assess** the associated **human health risk**
- **to trigger** a more timely and effective **control of the disease** in humans

Integration of the veterinary, entomological and human surveillance systems is an essential public health tool.

IZS

T E R A M O

/

ISTITUTO
ZOOPROFILATTICO
SPERIMENTALE
DELL'ABRUZZO
E DEL MOLISE
"G. CAPORALE"

Thank you

