WOAH Reference Laboratory Reports Activities 2022

Activities in 2022

This report has been submitted: 14 février 2023 17:32

**Laboratory Information**

- **Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:** West Nile fever
- **Address of laboratory:** Via Campo Boario 64100 Teramo ITALY
- **Tel.:** +39 0861 2231
- **E-mail address:** f.monaco@izs.it
- **Website:** www.izs.it
- **Name (including Title) of Head of Laboratory (Responsible Official):** Nicola D’Alterio, General Director, Istituto Zooprofilattico Sperimentale dell’Abruzzo e del Molise, “G. Caporale”
- **Name (including Title and Position) of WOAH Reference Expert:** Federica Monaco, Head of the diagnosis and surveillance of exotic viral diseases of animals laboratory Istituto Zooprofilattico Sperimentale dell’Abruzzo e del Molise “G. Caporale”
- **Which of the following defines your laboratory? Check all that apply:** Governmental

**TOR1: DIAGNOSTIC METHODS**

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

<table>
<thead>
<tr>
<th>Diagnostic Test</th>
<th>Indicated in WOAH Manual (Yes/No)</th>
<th>Total number of test performed last year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nationally</td>
<td>Internationally</td>
</tr>
<tr>
<td>Indirect diagnostic tests</td>
<td>Yes</td>
<td>207</td>
</tr>
<tr>
<td>c-ELISA - IgG</td>
<td>Yes</td>
<td>165</td>
</tr>
<tr>
<td>ELISA - IgM</td>
<td>Yes</td>
<td>197</td>
</tr>
<tr>
<td>Virus Neutralization (microtitre)</td>
<td>Yes</td>
<td>443</td>
</tr>
</tbody>
</table>

WOAH Reference Laboratory Reports Activities 2022
Real-time RT-PCR WNV lineage 1 and Lineage 2  | Yes | 3107 | -
Real-time RT-PCR WNV all lineages | No | 3107 | -
Whole genome sequencing | No | 99 | -

**TOR2: REFERENCE MATERIAL**

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by WOAH?  
No

3. Did your laboratory supply standard reference reagents (nonWOAH-approved) and/or other diagnostic reagents to WOAH Members?  
Yes

<table>
<thead>
<tr>
<th>TYPE OF REAGENT AVAILABLE</th>
<th>RELATED DIAGNOSTIC TEST</th>
<th>PRODUCED/ PROVIDE</th>
<th>AMOUNT SUPPLIED NATIONALLY (ML, MG)</th>
<th>AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)</th>
<th>NO. OF RECIPIENT WOAH MEMBER COUNTRIES</th>
<th>COUNTRY OF RECIPIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purified MoAb vs WNV</td>
<td>Immunofluorescence, ELISA</td>
<td>Produced</td>
<td>48 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Vero/P cells</td>
<td>Virus isolation on tissue culture</td>
<td>Produced and provided</td>
<td>30 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Vero/C6/36 cells</td>
<td>Virus isolation on tissue culture</td>
<td>Produced and provided</td>
<td>30 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>WNV lineage 1 reference strain Eg101</td>
<td>RT-PCR</td>
<td>Produced and provided</td>
<td>21 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>WNV lineage 2 reference strain B956</td>
<td>RT-PCR</td>
<td>Produced and provided</td>
<td>21 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>WNV field strain</td>
<td>RT-PCR</td>
<td>Produced and provided</td>
<td>30 ml</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

4. Did your laboratory produce vaccines?  
No

5. Did your laboratory supply vaccines to WOAH Members?  
No

**TOR3: NEW PROCEDURES**

6. Did your laboratory develop new diagnostic methods for the designated pathogen or disease?  
No

7. Did your laboratory validate diagnostic methods according to WOAH Standards for the designated pathogen or disease?  
No

8. Did your laboratory develop new vaccines for the designated pathogen or disease?  
No

9. Did your laboratory validate vaccines according to WOAH Standards for the designated pathogen or disease?  
No

WOAH Reference Laboratory Reports Activities 2022
**TOR4: DIAGNOSTIC TESTING FACILITIES**

10. Did your laboratory carry out diagnostic testing for other WOAH Members?

Yes

<table>
<thead>
<tr>
<th>NAME OF WOAH MEMBER COUNTRY SEEKING ASSISTANCE</th>
<th>DATE</th>
<th>WHICH DIAGNOSTIC TEST USED</th>
<th>NO. SAMPLES RECEIVED FOR PROVISION OF DIAGNOSTIC SUPPORT</th>
<th>NO. SAMPLES RECEIVED FOR PROVISION OF CONFIRMATORY DIAGNOSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMIBIA</td>
<td>2022-10-01</td>
<td>c-ELISA IgG and VNT</td>
<td>546</td>
<td>-</td>
</tr>
<tr>
<td>BULGARIA</td>
<td>2022-12-01</td>
<td>ELISA IgM</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

11. Did your laboratory provide expert advice in technical consultancies on the request of an WOAH Member?

Yes

<table>
<thead>
<tr>
<th>NAME OF THE WOAH MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY</th>
<th>PURPOSE</th>
<th>HOW THE ADVICE WAS PROVIDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>GERMANY</td>
<td>Possible approaches to WNV surveillance and control based on the Italian experience</td>
<td>Preliminary questionnaire and on line discussion</td>
</tr>
<tr>
<td>GERMANY</td>
<td>WNV as prototype of One-Health surveillance (in the framework of the project «Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards - OneHealth EJP – MATRIX »</td>
<td>On line discussion</td>
</tr>
<tr>
<td>ITALY</td>
<td>In the framework of the national surveillance plan for WNV and Usutu virus for 2022, the laboratory has been in charge for: - defining the surveillance activities in animals and vectors; - harmonizing and assessing the diagnostic capabilities of the regional laboratories network through proficiency tests; - the collection and management of the data generated by the surveillance activities in animals and vectors.</td>
<td>In loco and remote assistance</td>
</tr>
</tbody>
</table>

**TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES**

12. Did your laboratory participate in international scientific studies in collaboration with WOAH Members other than the own?
### Title of the Study

**Senegal – Italy Arbovirus Introduction and Emergence (SIAIE)**  
3 years

**European network of medical and veterinary entomology (VectorNet)**  
5 years

### Purpose of the Study

**Senegal – Italy Arbovirus Introduction and Emergence (SIAIE)**: Characterization of WNV and USUV, geographically and within specific host and vector populations, between Senegal and Italy.

**European network of medical and veterinary entomology (VectorNet)**: Developing a network of medical and veterinary experts and organisations to maintain a common database on the presence and distribution of vectors and pathogens in vectors across Europe and the Mediterranean basin.

### Partners (Institutions)

**Senegal – Italy Arbovirus Introduction and Emergence (SIAIE)**
- Institute Pasteur, Senegal
- Fondazione Edmund Mach, Italy

**European network of medical and veterinary entomology (VectorNet)**
- ECDC EFSA Experts and organisations from the medical and veterinary domains

### WOAH Member Countries Involved Other Than Your Country

**Senegal**

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**TOR6: EPIZOOLOGICAL DATA**

14. Did your Laboratory collect epidemiological data relevant to international disease control?  
Yes

**IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:**

- Italian data are collected from the Sistema Informativo Nazionale Malattie Animali (SIMAN) https://www.vetinfo.it/(Italy)
- Data about human outbreaks in EU Member States and EU neighbouring countries are collected from the European Surveillance System (TESSy) database while worldwide animal data are collected through the Animal Disease Information System (ADIS) of the European Commission and the World Animal Health Information System (WAHIS) database. https://wahis.woah.org/#/home  
  Furthermore, outbreak data referred to human cases in Greece are retrieved from the National Public Health Organization (NPHO) Report_WNV_20220906_ENG.pdf (eody.gov.gr):

15. Did your laboratory disseminate epidemiological data that had been processed and analysed?  
Yes

**IF THE ANSWER IS YES, PLEASE PROVIDE DETAILS OF THE DATA COLLECTED:**

A Web Geographic Information System application has been developed to collect and disseminate disease data, and full genome sequences of selected isolated strains of WNV. The tool (Disease Monitoring Dashboard) compiles multiple datasets through user-friendly web tools for epidemiological analysis (https://netmed.izs.it/networkMediterraneo/)

WNV data are disseminated through a public web site (www.izs.it) where information and data on WN is continuously updated in order to have:

- weekly bulletins summarizing the current (2022) epidemiological situations in Italy and Mediterranean Basin;  
- maps on entomological, virological and serological surveillance activities;  
- the past epidemiological situations in Italy (2008-2021) and the Mediterranean Basin (2010-2021);  
- the latest on the Italian and European Regulations;  
- scientific documents on-line.
Since 2018 surveillance activities are summarized in the interactive StoryMaps available on the public web site (https://westnile.izs.it/j6Wnd/home) and provide a description of the disease and the complete data from the human, animal and entomological surveillance activities.

A predictive model to identify area at risk for WNV circulation has been developed and is freely accessible (https://mapserver.izs.it/gis_wn_predictions/#). The model uses EO data with the WNV detection in mosquitoes, birds and horses since 2017 to train an Extreme Gradient Boosting model to automatically predict in space and time WNV circulation.

16. What method of dissemination of information is most often used by your laboratory? (Indicate in the appropriate box the number by category and list the details in the box)

a) Articles published in peer-reviewed journals:

10


b) International conferences:

3


c) National conferences:

3
1. Pati, S. Pupella, A. Bella F. Iapaolo, M. La Raja, F. Riccardo, D. Morelli, F. Masiello, V. De Angelis Integrated surveillance and response to West Nile virus in the Italian blood transfusion network ISBT 2022 Virtual Congress


d) Other (Provide website address or link to appropriate information):

4
Please refer to the answer provided for the question n. 15 for the details related to the links listed below:

Epidemiological situation in Italy and the Mediterranean region: www.izs.it

TOR7: SCIENTIFIC AND TECHNICAL TRAINING

17. Did your laboratory provide scientific and technical training to laboratory personnel from other WOAH Members?

Yes

a) Technical visit : 1

b) Seminars : -

c) Hands-on training courses: 3

d) Internships (>1 month) 2

<table>
<thead>
<tr>
<th>Type of technical training provided (a, b, c or d)</th>
<th>Country of origin of the expert(s) provided with training</th>
<th>No. participants from the corresponding country</th>
</tr>
</thead>
</table>

WOAH Reference Laboratory Reports Activities 2022
Federica Monaco - West Nile fever - ITALY

<table>
<thead>
<tr>
<th></th>
<th>Argentina</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>Albania</td>
<td>1</td>
</tr>
<tr>
<td>c</td>
<td>Serbia</td>
<td>2</td>
</tr>
<tr>
<td>d</td>
<td>Croatia</td>
<td>1</td>
</tr>
<tr>
<td>d</td>
<td>Italy</td>
<td>1</td>
</tr>
</tbody>
</table>

**TOR8: QUALITY ASSURANCE**

18. Does your laboratory have a Quality Management System?

Yes

**Quality management system adopted**                                    **Certificate scan (PDF, JPG, PNG format)**
---                         ---
17025                       Accreditation certificate.pdf

19. Is your quality management system accredited?

Yes

<table>
<thead>
<tr>
<th>Test for which your laboratory is accredited</th>
<th>Accreditation body</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-ELISA - IgG</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>c-ELISA IgG</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>ELISA IgM</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>Plaque Reduction neutralization test (PRNT)</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>Virus neutralization (microtitre format)</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>Real-time RT-PCR WNV lineage 1</td>
<td>ACCREDIA</td>
</tr>
<tr>
<td>Real-time RT-PCR WNV lineage 1 and lineage 2</td>
<td>ACCREDIA</td>
</tr>
</tbody>
</table>

20. Does your laboratory maintain a "biorisk management system" for the pathogen and the disease concerned?

Yes

The biosecurity policy integrates aspects related to safety, security and environment, in fact risks associated with all our activities are assessed and managed to ensure the safety of workers and of the environment in accordance with international standards. In particular, IZS-Teramo has developed its biosecurity manual in accordance with the WHO standards "The WHO Laboratory Biosafety Manual (LBM) 4th ed." as well as the specific procedures for safe handling and containment of infectious microorganisms and hazardous biological material. Furthermore, to reduce or eliminate the exposure of the environment (air, water, soil) to potentially infectious or hazardous agents IZSAM obtained the certification according to the ISO 14001. Lastly, a rigorous management of biologicals, chemicals and their associated waste is in place and information and communication to personnel done on a routine bases. To ensure the safety handling and movement of goods, the IZS-Teramo has developed protocols and procedures according to the World Health Organization standards (WHO/WHE/CPI/2019.20 Guidance on regulations for the Transport of infectious Substances" - 2019-2020; pag.1-29.). The laboratory is officially authorised by the Italian Ministry of Health to import biological materials and biological reagents of any origin through the airports of Rome (Fiumicino) and Milan (Malpensa and Linate) Transport by air of biological materials considered as infectious substances is done according to the international regulations guidelines developed by IATA (Infectious Substances Shipping Guidelines-1 January 2006- 7th Edition p.1-41). The IZS - Teramo also complies with ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road and Directive 2014/103/UE) regulations to guarantee the safe road transportation of
dangerous goods and owns vehicles properly equipped for the purpose. Traceability of biological material for research purposes is provided by the use of MTA, and dispatch and receipt are regulated by Standard Operating procedures.

**TOR9: SCIENTIFIC MEETINGS**

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?
   No

22. Did your laboratory participate in scientific meetings related to the pathogen in question on behalf of WOAH?
   Yes

<table>
<thead>
<tr>
<th>Title of event</th>
<th>Date (mm/yy)</th>
<th>Location</th>
<th>Role (speaker, presenting poster, short communications)</th>
<th>Title of the work presented</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEIA Atelier Télédétection Et Risques &amp; Maladies Infectieuses</td>
<td>2022-11-01</td>
<td>Virtual meeting</td>
<td>Speaker</td>
<td>Sentinel 2 and Deep Learning methods to map Culex pipiens distribution in central Italy</td>
</tr>
<tr>
<td>West Nile virus Sorveglianza integrata e sieroprevalenza nei donatori di sangue ed emocomponenti e nei donatori di organi, cellule e tessuti in Italia</td>
<td>2022-12-06</td>
<td>Rome, Italy</td>
<td>Speaker</td>
<td>Epidemiologia veterinaria dell’infezione da WNV e Usutu</td>
</tr>
<tr>
<td>Le malattie da vettori nell’interfaccia uomo/animale: focus su WNV/USUV ma non solo</td>
<td>2022-12-07</td>
<td>Virtual meeting</td>
<td>Speaker</td>
<td>Situazione attuale WNV/USUV in Europa e in Italia</td>
</tr>
<tr>
<td>ESA Living Planet Symposium</td>
<td>2022-05-05</td>
<td>Bonn, Germany</td>
<td>Poster</td>
<td>Sentinel 2 and Deep Learning methods to map Culex pipiens distribution in central Italy</td>
</tr>
<tr>
<td>37th International Congress of the International Society of Blood Transfu</td>
<td>2022-06-10</td>
<td>Virtual meeting</td>
<td>Poster</td>
<td>Integrated surveillance and response to West Nile virus in the Italian blood transfusion network</td>
</tr>
<tr>
<td>MOOD - Identify Signs And Drivers Of Zoonotic Diseases Emergence And Digital Data Resources For Epidemic Intelligence</td>
<td>2022-09-22</td>
<td>Trento, Italy</td>
<td>Poster</td>
<td>Sentinel 2 and Deep Learning methods to map Culex pipiens distribution in central Italy</td>
</tr>
</tbody>
</table>

**TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES**

23. Did your laboratory exchange information with other WOAH Reference Laboratories designated for the same pathogen or disease?
   No

24. Are you a member of a network of WOAH Reference Laboratories designated for the same pathogen?
   No
25. Did you organise or participate in inter-laboratory proficiency tests with WOAH Reference Laboratories designated for the same pathogen?
No

26. Did your laboratory collaborate with other WOAH Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?
No

**TOR11: OTHER INTERLABORATORY PROFICIENCY TESTING**

27. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than WOAH Reference Laboratories for the same pathogen?
Yes

<table>
<thead>
<tr>
<th>Purpose for inter-laboratory test comparisons</th>
<th>Role of your reference laboratory (organizer/participant)</th>
<th>No. participating laboratories</th>
<th>Region(s) of participating WOAH Member Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining a laboratory's capability to conduct specific diagnostic tests. Molecular assays: RT-PCR for viral detection and/or Lineage identification</td>
<td>Organizer</td>
<td>13</td>
<td>Europe</td>
</tr>
<tr>
<td>Determining a laboratory's capability to conduct specific diagnostic tests. Serological assays: ELISA IgG, ELISA IgM</td>
<td>Organizer</td>
<td>11</td>
<td>Europe</td>
</tr>
</tbody>
</table>

**TOR12: EXPERT CONSULTANTS**

28. Did your laboratory place expert consultants at the disposal of WOAH?
No

29. Additional comments regarding your report:
No