OIE Reference Laboratory Reports Activities

Activities in 2020

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	West Nile Fever
Address of laboratory:	Via Campo Boario 64100 Teramo ITALY
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Name (including Title) of Head of Laboratory (Responsible Official):	Nicola D'Alterio General Director Istituto Zooprofilattico Sperimentale Abruzzo e Molise Teramo, Italy
Name (including Title and Position) of OIE Reference Expert:	Federica Monaco Head of the diagnosis and surveillance of exotic diseases of animals laboratory Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise
Which of the following defines your laboratory? Check all that apply:	Governmental Research

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

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

Diagnostic Test	Indicated in OIE Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
c-ELISA - IgG	Yes	248	0
ELISA - IgM	Yes	41	1
Virus Neutralization (microtitre)	Yes	58	968
Direct diagnostic tests		Nationally	Internationally
Virus isolation (C6/36 and Vero cells)	Yes	273	0
Real-time RT-PCR WNV lineage 1 and Lineage 2	Yes	2,360	15
Real time RT-PCR Flavivirus group	No	173	0
Whole genome sequencing	No	75	0

ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by the OIE?

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Usutu strain 939 (inactivated)	Real-time RT-PCR	provided	8 ml	0	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
WNV strain B956 (inactivated)	Real-time RT-PCR	provided	2 ml	0	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
WNV strain Eg101 (inactivated)	Real-time RT-PCR	provided	2 ml	0	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
WNV lineage1 strain ITA 2008TE15217 (inactivated)	Real-time RT-PCR	produced	30 ml	0	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
WNV lineage 2 strain ITA 2012TE201681 (inactivated)	Real-time RT-PCR	provided	0	8 ml	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
WNV virus lineage 1(8 field Italian strain)	Real-time RT-PCR	provided	0	11 ml	1	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

No

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

No

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

Yes

Name of OIE Member Country seeking assistance	Date (month)	No. samples received for provision of diagnostic support	No. samples received for provision of confirmatory diagnoses
BULGARIA	January	-	2 RNA - 13 WNV strains
LIBYA	February	63 dog sera -582 horse sera	-
TUNISIA	November	1 horse serum - 179 chicken sera and 62 chicken feathers	-
NAMIBIA	November	38 horse sera - 106 donkey sera	-

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
ITALY	In the framework of the national surveillance plan for WNV and Usutu virus for 2020, the laboratory has been in charge for: 1) defining the surveillance activities in animals and vectors; 2) harmonizing and assessing the diagnostic capabilities of the regional laboratories network through proficiency tests; 3) the collection and management of the data generated by the surveillance activities in animals and vectors	Remote assistance
FRANCE	Investigate the pathogenicity of flaviviruses circulating in the Mediterranean area	Remote assistance
CROATIA	Support to the diagnostic capabilities	Remote assistance

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Risk of introduction and spread of vector-borne viruses in Italy	3 years	Assessment and comparison of vector competency of the Italian populations of Culex pipiens in WNV lineages 1 and 2 transmission	Etlik Veterinary Control Central Research Institute, Turkey	TURKEY
Epidemiological models for control of arboviral diseases for Europe (ARBONET)	3 years	Epidemiological modelling of possible scenarios of WNV spread in EU evaluating possible risk-based surveillance approaches and outbreak control. Promote and support epidemiological studies on distribution of viral genetic subpopulation. To increase the actual knowledge of virus-vector and virus-vertebrate host interactions.	Karolinska Institute, Sweden; Friedrich-Loeffler-Instituts, Germany; Pirbright Institute, UK; ANSES, France; Kimron Institute, Israel; Institute Pasteur, France; Animal and Plant Health Agency, UK	FRANCE GERMANY ISRAEL SWEDEN UNITED KINGDOM
Artificial Intelligence and Earth Observation data: innovative methods for monitoring West Nile Disease spread in Italy (ESA/AO/1-9101/17/I-NB)	12 months	Develop an innovative, scalable and accurate process to produce West Nile Disease (WND) risk maps, using Earth Observation data (Sentinel-2, Sentinel-3, PROBA-V, etc.) and specific Artificial Intelligence algorithms (learning architecture based on Convolutional Neural Network and Graph Theory.	AImageLab, University of Modena and Reggio Emilia, Italy; Progressive Systems, Frascati, Italy; ReMedia Italy, Rome, Italy; European Space Agency EO Science for Society programme, Frascati, Italy	ITALY

Med-Vet ET-1 JRP “Metagenomic Array Detection of emerging Virus in EU” (MAD-VIR)	2 years	Microarray assay to identify simultaneously vector borne pathogens including WNV	Satens Serum Institute, Denmark Agence nationale de sécurité sanitaire de l’alimentation, de l’environnement et du travail (ANSES), France; National Veterinary Research Institute (NVRI-PIWet), Poland; Animal and Plant Health Agency (APHA), UK; National Center for Epidemiology (OIK), Hungary; Veterinary Research Institute (VRI), Czech Republic; Surrey Univ. (UoS), UK	CZECH REPUBLIC DENMARK FRANCE HUNGARY ITALY POLAND SPAIN UNITED KINGDOM

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
Data about human outbreaks in EU Member States and EU neighbouring countries are collected from the European Surveillance System (TESSy) database while animal data are collected through the Animal Disease Notification System (ADNS) of the European Commission and the World Animal Health Information System (WHAIS) database (https://www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/Diseasehome). Furthermore, outbreak data referred to animal cases are retrieved from National Public Health Organizations of the affected countries: • Junta de Andalucia (https://www.juntadeandalucia.es/index.html) (Spain) • Hellenic Centre of disease a prevention Keelpno (https://eody.gov.gr/en/epidemiological-statistical-data/weekly-epidemiological-reports/) (Greece) • Agence régionale de santé Provence-Alpes-Côte d'Azur (ARS Paca) https://www.paca.ars.sante.fr/recherche-globale?search_ars=west+nile (France) • Sistema Informativo Nazionale Malattie Animali (SIMAN) https://www.vetinfo.it/ (Italy)

12. Did your laboratory disseminate epizootiological 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, climatic and environmental remote sensed data, 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/) In the framework of FP7 project “International Network for Capacity Building for the Control of Emerging Viral Vector Borne Zoonotic Diseases (Arbozoonet), a WEB-GIS model has been designed and regularly updated to collect and map WNV data coming from official notifications and from literature (http://arbozoonet.izs.it/arbozoonet/) WNV data are disseminated through a public web site (www.izs.it) where information and data on West Nile is continuously updated in order to have: - weekly bulletins during the epidemic season summarizing the current epidemiological situations in Italy and the Mediterranean Basin; - maps on entomological, virological and serological surveillance activities; - the past epidemiological situations in Italy and the Mediterranean Basin; - the latest on the Italian and European Regulations issued by the Italian Ministry of Health; - scientific documents on-line

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

a) Articles published in peer-reviewed journals: 5
1. Candeloro, L.; Ippoliti, C.; Iapaolo, F.; Monaco, F.; Morelli, D.; Cuccu, R.; Fronte, P.; Calderara, S.; Vincenzi, S.; Porrello, A.; D’Alterio, N.; Calistri, P.; Conte, A. Predicting WNV Circulation in Italy Using Earth Observation Data and Extreme Gradient Boosting Model. Remote Sens. 2020, 12, 3064
2. Emna Benzarti, José Rivas, Michaël Sarlet, Mathieu Franssen, Daniel Desmecht, Jonas Schmidt-Chanasit, Giovanni Savini, Alessio Lorusso, Anne-Sophie Van Laere, Mutien-Marie Garigliany. Experimental Usutu Virus Infection in Domestic Canaries Serinus canaria. Viruses. 2020 Feb; 12(2): 164. Published online 2020 Jan 31. doi: 10.3390/v12020164
3. Emna Benzarti, José Rivas, Michaël Sarlet, Mathieu Franssen, Nassim Moula, Giovanni Savini, Alessio Lorusso, Daniel Desmecht, Mutien-Marie Garigliany Usutu Virus Infection of Embryonated Chicken Eggs and a Chicken Embryo-Derived Primary Cell Line. Viruses. 2020 May; 12(5): 531. Published online 2020 May 12. doi: 10.3390/v12050531. PMCID: PMC7291025
4. Tatjana Vilibic-Cavlek, Tamas Petrovic, Vladimir Savic, Ljubo Barbic, Irena Tabain, Vladimir Stevanovic, Ana Klobucar, Anna Mrzljak, Maja Ilic, Maja Bogdanic, Iva Benvin, Marija Santini, Krunoslav Capak, Federica Monaco, Eddy Listes, Giovanni Savini. Epidemiology of Usutu Virus: The European Scenario. Pathogens. 2020 Sep; 9(9): 699. Published online 2020 Aug 26. doi: 10.3390/pathogens9090699. PMCID:PMC7560012
5. William C. Wilson, Dana Mitzel, Giovanni Savini, Stéphan Zientara, Juergen A. Richt. Editorial: Emerging Arboviruses. Front Vet Sci. 2020; 7: 593872. Published online 2020 Nov 6. doi: 10.3389/fvets.2020.59387.PMCID: PMC7677233

b) International conferences: 8
1. Goffredo M. : “The role of vectors in the transmission of arboviruses”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 9 July 2020. Oral presentation
2. Goffredo M. : “Aims of entomological monitoring and surveillance”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 9 July 2020. Oral presentation
3. De Ascentis M. : “Collection methods for mosquitoes”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 10 July 2020. Oral presentation
4. D’Alessio S.G. : “Collection sites for mosquito sampling”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 10 July 2020. Oral presentation
5. Quaglia M. : “Management of the entomological samples”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 10 July 2020. Oral presentation
6. Santilli A. “Family Culicidae Introduction to mosquitoes: taxonomy and identification of Culicidae family; Genera of Culicidae Identification of adult Culicidae at genus level- Identification of Culicidae larvae; Identification of Culicidae Aedes: species identification; Other genera Genus Anopheles: species identification; Genus Culiseta: species identification; Genera Orthopodomyia, Coquillettidia, Uranotaenia: species identification.” Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 13 - 14 July 2020. Oral presentation
7. Quaglia M. : “Mosquito pools for virus detection”. Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological surveillance; 15 July 2020. Oral presentation
8. Cosseddu GM, : Methods for virus detection and characterization in mosquito pools: PCR, Virus isolation and sequencing Virtual Learning course on Rift Valley Fever and other Mosquito-borne arboviroses: entomological

surveillance; 15 July 2020.Oral presentation. Oral presentation

c) National conferences: 0

d) Other:
(Provide website address or link to appropriate information) 3
Epidemiological situation in Italy and the Mediterranean region: www.izs.it
Disease Monitoring Dashboard: https://netmed.izs.it/networkMediterraneo/
International Network for Capacity Building for the Control of Emerging Viral Vector Borne Zoonotic Diseases (Arbozoonet): http://arbozoonet.izs.it/arbozoonet/

ToR 7: To provide scientific and technical training for personnel from OIE Member Countries
To recommend the prescribed and alternative tests or vaccines as OIE Standards

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 0
b) Seminars: 0
c) Hands-on training courses: 0
d) Internships (>1 month): 1

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
d	Italy	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
UNI CEI EN ISO/IEC 17025:2018	ACCREDIA_IZSAM_Italy.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
i-ELISA - IgG	Accredia
c-ELISA- - IgG	Accredia
ELISA IgM	Accredia
Plaque Reduction neutralization test (PRNT)	Accredia
Virus neutralization (microtitre format)	Accredia
Real-time RT-PCR WNV lineage 1	Accredia
Real-time RT-PCR WNV lineage 1 and lineage 2	Accredia

17. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

(See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

Yes

National/ International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	ERFAN-Enhancing Research for Africa Network Working groups meeting	Faculty of Veterinary Science, Pretoria, South Africa	11/20	on-line	25

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
Virtual symposium“Zoonotic and vector-borne diseases in Europe in the 'one health' context.”	10/20	on-line	speaker	Flaviviruses in Italy

ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

20. Did your laboratory exchange information with other OIE Reference Laboratories designated for the same pathogen or disease?

No

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

No

22. Did your laboratory collaborate with other OIE Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

No

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing see point 1.3

Purpose for inter-laboratory test comparisons[1]	No. participating laboratories	Region(s) of participating OIE Member Countries
Determining a laboratory's capability to conduct specific diagnostic tests. Serological assays: ELISA IgG, ELISA IgM. Organizer.	13	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
Determining a laboratory's capability to conduct specific diagnostic tests. Molecular assays: RT-PCR for WNV detection and/or Lineage identification. Organizer.	11	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
Serology of equine infections by arthropod-borne encephalitis viruses (WNV, JEV, EEEV, WEEV and VEEV). Participant	not available	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East
Molecular detection (RT-PCR) of equine infections by arthropod-borne encephalitis viruses (WNV, JEV, EEEV, WEEV and VEEV). Participant	not available	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report:

The IZSAM has been heavily involved in the Covid-19 pandemic activities(swab analysis, epidemiological studies, etc.). The national regulations regarding the pandemic has stopped activities in presence and across countries.