

WOAH Collaborative Centre Reports Activities 2024

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CENTRE INFORMATION

*Title of WOAHCollaborating Centre	Epidemiology, modelling and surveillance
*Address of WOAHCollaborating Centre	Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale"
*Tel:	+39 0861 33.22.05
*E-mail address:	p.calistri@izs.it
Website:	www.izs.it
*Name Director of Institute (Responsible Official):	Nicola D'Alterio
*Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Paolo Calistri - Responsible of Epidemiology Laboratory
*Name of the writer:	Paolo Calistri

TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOAHC

Category	Title of activity	Scope
		In the framework of the project titled "Defining Ecoregions and Prototyping on

Epidemiology, surveillance, risk assessment, (true)	Defining Ecoregions and Prototyping on EO-based Vector-borne Disease Surveillance System for North Africa (PROVNA)	EO-based Vector-borne Disease Surveillance System for North Africa (PROVNA)" satellite data of various climatic and environmental indexes have been analysed with the production of dynamic maps representing the "eco-regions" of the six countries (Mauritania, Morocco, Algeria, Tunisia, Libya, Egypt) of North Africa region. These "eco-regions" will be used to guide the surveillance for vector-borne diseases, and in particular for Rift Valley fever. The PROVNA project ended on July 2024.
Training, capacity building (true)	Twinning Project on Epidemiology and risk assessment between Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale" (IZS-Teramo) and the Department of Animal Resources Risk Assessment (KSA ARRAD), Kingdom of Saudi Arabia	The project ended in July 2024. Three Weqaa's (former ARRAD) personnel were trained on rapid risk assessment methods in Teramo from February 5 to 14, 2024. Furthermore, a practical session for the discussion and development of two risk assessment studies was held in Riyadh from 7 to 9 May 2024, during which the Weqaa's personnel, with the support of three facilitators from IZS-Teramo, worked on the development of risk profiles, formulation of questions and definition of risk pathways for foot and mouth disease (FMD) and bluetongue (BT) and the development of a quantitative risk assessment model for FMD. The results of the two risk assessment studies were presented by the Weqaa's personnel during the final meeting held in Riyadh on 4 June 2024.
Epidemiology, surveillance, risk assessment, (true)	Establishment of a risk-based surveillance system for Mosquito-Borne Diseases in North Africa (PROVNA2)	The second phase of the PROVNA project (called PROVNA2), aims at establishing a risk-based surveillance system across North Africa for mosquito-borne diseases (MBDs), using the eco-regionalization method developed in the so-called "phase 1" of the PROVNA project (Defining Ecoregions and Prototyping on EO-based Vector-borne Disease Surveillance System for North Africa), and capitalising on its findings and recommendations. The PROVNA2 project started on August 2024 and will end on January 2026.
Epidemiology, surveillance, risk assessment, (true)	Provisional model for WNF circulation in Italy	The provisional model for WNF circulation in Italy, based on climatic data and the results of the integrated national surveillance plan for WNF, was the basis of the development of this free application, able to predict the risk of WNF circulation with a time window of 15 days. The application and the algorithms have been improved and calibrated. https://mapserver.izs.it/gis_wn_predictions/#
Epidemiology, surveillance, risk assessment, (true)	African Swine Fever (ASF) epidemiological bulletin	An epidemiological bulletin has been developed and constantly updated with the most recent data on the situation of African Swine Fever (ASF) in Italy, showing monitoring results using maps, tables, graphs and narrative text. The bulletin is available (English version) on https://storymaps.arcgis.com/stories/9fe6aa3980ca438cb9c7e8d656358f35
Epidemiology, surveillance, risk assessment, (true)	West Nile disease and Usutu epidemiological bulletins	A dedicated website, with story maps with the annual reports summarizing the results of West Nile virus and the Usutu virus surveillance activities in Italy have been developed and available on https://storymaps.arcgis.com/collections/b50666024702441dac792d0cb3aee32c

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Epidemiology, surveillance, risk assessment, (true)	Management of the Veterinary National Epidemiological Bulletin	The Veterinary National Epidemiological Bulletin is published quarterly and contains the main figures regarding the epidemiological situation of animal diseases in Italy and some articles on main emerging arguments. https://www.izs.it/BENV_NEW/index_en.html
Training, capacity building (true)	IAEA Study visit	Under the request of the International Atomic Energy Agency (IAEA), four fellowships (8-19/4/2024 and 6-31/5/2024) from the Faculty of Veterinary Medicine; Ss. Cyril and Methodius University, North Macedonia, were hosted at the Institute of Teramo for laboratory stages and study visits on whole genome sequencing (WGS) of DNA and RNA viruses, bioinformatic analyses and epidemiological considerations.
Training, capacity building (true)	WOAH Sub-Regional Representation for Arabian Gulf. Workshop on "Towards improved understanding & control of Vector-Borne Diseases in GCC and the Arabian Peninsula"	Two representatives of the WOAHC participated at the workshop on "Towards improved understanding & control of Vector-Borne Diseases in GCC and the Arabian Peninsula", organised by the WOAHC Sub-Regional Representation for Arabian Gulf and held in Abu Dhabi on 29-30 July 2024.
Training, capacity building (true)	Establishment of a risk-based surveillance system for Mosquito-Borne Diseases in North Africa (PROVNA2)	A Regional Workshop on "Rift Valley Fever surveillance in Northern African countries" has been organised, in collaboration with the WOAHC Subregional Office for North Africa, in Tunis from 12 to 14 November 2024. The workshop aimed at jointly defining the surveillance and diagnostic protocols and programmes for the surveillance of Rift Valley fever (RVF). Representatives from 5 countries (Mauritania, Morocco, Algeria, Tunisia, Libya, Egypt) participated.

TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable Area

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAHC?

No

4. Did your Collaborating Centre maintain a network with other WOAHC Collaborating Centres (CC), Reference Laboratories (RL), or

organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOAHC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOAH CC on risk analysis and modelling	UK	Europa	On 20 November 2024, a delegation from the Animal Plant Health Agency (APHA UK) and the Royal Veterinary College visited IZS of Teramo to discuss bilateral scientific collaboration and partnerships in international activities. A joint programme of activities for 2025 are under discussion.
WOAH CC on Epidemiology Emerging Avian Diseases	Italy	Europa	Implementation of a standard for the collection and sharing of zone geographic component (GeoZone)
National Center for Global Health Istituto Superiore di Sanità (ISS)	Italy	Europa	Project "Preventing biological risks increased by environmental and climate change in the Mediterranean, Black Sea and Sahel regions by strengthening a structured, inclusive and institutionalized One Health approach" (MediLabSecure)
European Space Agency (ESA)	France	Europa	Collaboration in the framework of various project initiatives in the fields of Earth Observation Data and Satellite Imagery.

TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHC Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHC/RL/other		Region of	
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organisation(s)	Location	networking Centre	Purpose
WOAH CC on Reduction of the Risk of Disasters in Animal Health	Cuba	Americas	Collaboration in the framework of the OIE Collaborating Centre network on Veterinary Emergencies (OIE EmVetNet)
WOAH Reference Laboratory for Viral Encephalopathy and Retinopathy of Marine Fish	Italy	Europe	Strengthening capacity on aquatic animal health and epidemiological surveillance (Aqua strength)
WOAH Collaborating Centre on Biological Threat Reduction	United States of America	Americas	Collaboration in the framework of the OIE Collaborating Centre network on Veterinary Emergencies (OIE EmVetNet)
WOAH CC on Animal Production Food Safety	Italy	Europe	Development of risk assessment models in food safety
WOAH CC on Veterinary Training and Capacity Building	Italy	Europe	Collaboration on international training initiatives including the development of e-learning contents on epidemiology, surveillance and risk analysis
ERFAN - Enhancing Research for Africa Network	Italy	Africa	Collaboration with training initiatives and project activities.
Anses - Agence nationale de sécurité sanitaire de l'alimentation	France	Europe	Project for provision of support to EFSA and to ECDC in the production of the EU One Health Zoonoses report and in related zoonoses online interactive data visualisation dashboards and zoonoses
			Project for provision of

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Istituto Superiore di Sanità	Italy	Europe	support to EFSA and to ECDC in the production of the EU One Health Zoonoses report and in related zoonoses online interactive data visualisation dashboards and zoonoses
Istituto Zooprofilattico Sperimentale delle Venezie	Italy	Europe	Project for provision of support to EFSA and to ECDC in the production of the EU One Health Zoonoses report and in related zoonoses online interactive data visualisation dashboards and zoonoses
Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna	Italy	Europe	Project for provision of support to EFSA and to ECDC in the production of the EU One Health Zoonoses report and in related zoonoses online interactive data visualisation dashboards and zoonoses

TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?H?

Yes

Name of expert	Kind of consultancy	Subject
Laura Amato	Participation in the 8th World One Health Congress Cape Town (South Africa) 20-23 September 2024	Presentation of PROVNA (first and second step) activities in the session "Innovative technologies for pathogen surveillance and detection"
Laura Amato	Participation at the 28th JPC REMESA Meeting and satellite workshop. Faro (Portugal) 11-14 June 2024	Defining Ecoregions and Prototyping on EO-based Vector-borne Disease Surveillance System for North Africa (PROVNA). Updates and next steps.
Calistri Paolo Daria Di Sabatino	Participation in the WOA?H Sub-Regional Representation for Arabian Gulf. Workshop on "Towards improved understanding & control of Vector-Borne Diseases in GCC and the Arabian	Presentations and management of working group sessions on vector borne diseases epidemiology, prevention and control, including risk communication approaches.

	Peninsula". Abu Dhabi (UAE) 29-30 July 2024.	
Annamaria Conte	Participation in the meeting of One Health High Level Expert Panel Cape Town (South Africa) 16-19 September 2024	Participation in the meeting of One Health High Level Expert Panel
Cesare Cammà Adriano Di Pasquale	Participation in Regional training on bioinformatics and data management, Nairobi, Kenya, 15 - 19 April 2024	Participation in Regional training on bioinformatics and data management in the framework of the initiative Fortifying Institutional Resilience Against Biological Threats (FIRABioT)
Nicolas Radomski	Participation in Regional training on bioinformatics and data management, Pasteur Institute of Tunis, Tunisia, 7 – 11 October 2024	Participation in Regional training on bioinformatics and data management in the framework of the initiative Fortifying Institutional Resilience Against Biological Threats (FIRABioT)

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

The WOAHC provide advice and/or services mainly in the establishment of the surveillance systems, including the design and development of supporting information systems, and risk assessment methodologies, providing advice to the competent authorities of WOAHC Members and through specific capacity-building initiatives. These activities are carried out in the framework of various projects upon different funding lines and other opportunities provided by international workshops and conferences. Of relevance the PROVNA initiative, which aims at supporting the surveillance activities for vector-borne diseases in the countries, following a risk-based approach based on ecoregions. Various countries expressed their interest in this approach and in the use of satellite data for strengthening the surveillance of infectious diseases. The WOAHC Member Countries mainly involved in these activities belong to the following geographical areas: North Africa, the Balkans, the Middle East, and the Arabic Peninsula. Sub-Saharan countries are involved through the ERFAN initiative.

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOAHC, to personnel from WOAHC Members?

Yes

a) Technical visit : 14

b) Seminars : 22

c) Hands-on training courses: 11

d) Internships (>1 month) : 3

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
C	WOAHC Twinning RRA II EDITION: Training course on Rapid risk assessment Teramo, 05-14/02/2024	Kingdom of Saudi Arabia	3

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A	IAEA Study visit, 8-19/04/2024	North Macedonia	2
C	WOAH Twinning Collaborating Centre: Training on the job. Rapid risk assessment, Riyadh, 06-09/05/2024	Kingdom of Saudi Arabia	8
A	IAEA Study visit. 6-31/05/2025	North Macedonia	2
B	WOAH twinning project on epidemiology and Risk assessment. Final Meeting Riyadh, 4 – 5/06/2024	Kingdom of Saudi Arabia	22
A	Technical visit of SENASA. Teramo, 08-12/07/2024	Argentina	3
D	Training period on bovine brucellosis. March-August 2024	Brazil	3
A	Scientific international collaboration (APHA). 20/11/2024	UK	7

TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?H?

No

TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA?H that may be useful to Members of WOA?H

a) Articles published in peer-reviewed journals:

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1. *Ippoliti C, Bonicelli L, De Ascentis M, Tora S, Di Lorenzo A, d'Alessio SG, Porrello A, Bonanni A, Cioci D, Goffredo M, Calderara S, Conte A. Spotting Culex pipiens from satellite: modeling habitat suitability in central Italy using Sentinel-2 and deep learning techniques.*

Frontiers in veterinary science 2024 Jul 4;11:1383320.

2. Ottaiano M, Brunetti R, Limone A, Capone MR, Di Giuseppe A, Conte A, De Massis F, Chiodini P, Signoriello S, Baldi L, De Carlo E. A Retrospective Study (2015-2020) on the Risk Factors Associated with the Persistence and Spread of Brucellosis in Buffalo Farms in Caserta Province, Italy. *Veterinary sciences* 2024 Mar 1;11(3):119.
3. Spedicato M, Profeta F, Thabet S, Teodori L, Leone A, Portanti O, Piscicella M, Bonfini B, Pulsoni S, Rosso F, Rossi E, Ripà P, De Rosa A, Ciarrocchi E, Irelli R, Cocco A, Sailleau C, Ferri N, Febo TD, Vitour D, Bréard E, Giansante D, Sghaier S, Hassine TB, Zientara S, Salini R, Hammami S, Savini G, Lorusso A. Experimental infection of cattle, sheep, and goats with the newly emerged epizootic hemorrhagic disease virus serotype 8 EHDV-8 in cattle, sheep, and goats.
4. De Ruvo A, De Luca A, Bucciaccchio A, Castelli P, Di Lorenzo A, Radomski N, Di Pasquale A. SPREAD: Spatiotemporal Pathogen Relationships and Epidemiological Analysis Dashboard. *Veterinaria italiana* 2024 Mar 20.
5. Pizzurro F, Nerone E, Ancora M, Di Domenico M, Mincarelli LF, Cammà C, Salini R, Di Renzo L, Di Giacinto F, Corbau C, Bokan I, Ferri N, Recchi S. Exposure of *Mytilus galloprovincialis* to Microplastics: Accumulation, Depuration and Evaluation of the Expression Levels of a Selection of Molecular Biomarkers. *Animals* 2023 - 12-19;14(1).
6. Zoppi G, Candeloro L, Savini L, Colizza V, Giacobini M. The hidden role of buffalo trade network in bovine epidemic spreading. *PLoS ONE* 19(11): e0313657. <https://doi.org/10.1371/journal.pone.0313657>.
7. Calistri, P. (2024a). Risk analysis: Definition of risk and scope of application. In M. Longeri (Ed.), *Risk assessment and communication in food safety* (pp. 85). Milano: Milano University Press.
8. Di Giuseppe A., Zenobio, V., Dall'Acqua, F., Di Sabatino, D. & Calistri, P. 2024. Lumpy Skin Disease. *Vet Clin Food Anim*, 40, 261–276. doi:10.1016/j.cvfa.2024.01.002
9. Milano A., Robbiati C., Declich S., Calistri P., Pediconi O., Amato L., Paronyan L., Avetisyan L., Manucharyan A., Avetisyan G., Yesayan T., Gevorgyan A., Markosyan T., & Dente M. G. (2024). Assessing the adoption of one health approaches in national plans to combat health threats: The pilot of a one health conceptual framework in Armenia MDPI AG. doi:10.3390/tropicalmed9010022
10. Cresci M., Di Sabatino D., Barbuceanu F., Tamba P., Motiu R., Motiu M., Manita F., Vincifori G., Ciarrocchi E., Bonfini B., Portanti O., Lorusso A., Hristescu D. & Calistri P. 2024. Validation of a real-time PCR assay for the detection of African swine fever virus in fresh pork meat juice (Title) – 1 – Web of Science Core Collection. *Journal OF Virological Methods*, 329 doi:10.1016/j.jviromet.2024.114980

b) International conferences:

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1. Amato L. - From Earth Observation to Vector-Borne Disease surveillance in the North African region, 8th One Health Global Conference, Cape Town, 19-23 September 2024.
2. Conte A.- Amato L. - One Health Award 2024. *Frontiera Africa*. 11-12 October 2024.
3. Ippoliti C. - Satellite Earth Observation data supporting vector-borne diseases International Workshop on Measurements and Applications in Veterinary and Animal Sciences (MeAVeAS 2024), 22-24 April 2024, University of Turin, Department of Veterinary Sciences, Torino.
4. Candeloro L. - Harnessing Satellite Technology for Vector-Borne Disease Surveillance: Insights from Italy and North Africa, EPIZONE 16th Annual Meeting Uppsala, Sweden 25-27 September 2024.
5. Conte A. - 9th International Conference on Emerging Zoonoses, "From pixels to knowledge", Palermo 9-12 June 2024.
6. Amato L. - MediLabSecure Final Meeting, "Defining Ecoregions and Prototyping on EO based Vector borne Disease Surveillance System for North Africa (PROVNA)", Domaine de Fremigny (France), 13 June 2024.
7. Conte A. - West Nile virus circulation and EO data: an Early Warning System in Italy. *ESA EO4Health User Forum 2024*, 15-16 January 2024.

c) National conferences:

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1. Savini L., Di Sabatino D. - T-Racing: Un tool per l'individuazione di path spazio-temporali a supporto delle indagini epidemiologiche - Giornata di studio annuale del COVEPI, 19-20 November 2024.
2. Candeloro L., Amato L. - Self Organizing Map e Earth Observation per la definizione di ecoregioni in Nord Africa: applicazione per VBD - Giornata di studio annuale del COVEPI, 19-20 November 2024.

3. Calistri P., Capone M.R. - *La situazione epidemiologica della Brucellosi bovina, bufalina ed ovicaprina sul territorio nazionale-Giornata di studio sulla Brucellosi-Roma, 14-15 October 2024.*
4. Cresci M., *Sistemi informativi nazionali e PSA: analisi delle attività di sorveglianza condotte in Molise. Peste suina africana: aggiornamenti in tema di diagnosi e tematiche di biosicurezza in emergenza nei laboratori e negli stabilimenti. Edizione Unica 29 October 2024, Perugia.*
5. Cresci M., *Sistemi informativi nazionali e PSA: analisi delle attività di sorveglianza condotte in Molise. Peste suina africana: aggiornamenti in tema di diagnosi e tematiche di biosicurezza in emergenza nei laboratori e negli stabilimenti. Gestione della PSA nelle zone sottoposte a restrizione. Campobasso 13-14 June 2024.*
6. Calistri P. - *Big data. Il supporto dei satelliti all'epidemiologia spaziale. Seconda giornata dei centri e dei laboratori di referenza nazionali degli istituti zooprofilattici sperimentali nell'ottica One Health. Roma 05 November 2024.*
7. Calistri P. - *Attività One Health Istituto di Teramo. Miodottore Connect - One Health. Roma 23 October 2024.*
8. Di Lorenzo A. - *L'esperienza di IZSAM. GEOSMARTCAMPUS, Conferenza Esri Italia 2024, 8-9 May 2024.*

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

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

More efforts and studies have been put into the development of practical applications able to provide high-value information derived from satellite data, coupled with other epidemiological data, to support the surveillance activities at local, national and international levels, following a risk-based approach.

12. Additional comments regarding your report: