World Organisation for Animal Health

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WOAH Collaborative Centre Reports Activities 2025

This report has been submitted: 23 janvier 2026 16:30

CENTRE INFORMATION

***Title of WOAH Collaborating Centre**	Field Epidemiology
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***Name of the writer:**	sana kalthoum

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 WOAH

Category	Title of activity	Scope
Disease control (true)	Evaluation of the rabies vaccination campaign	The evaluation of the vaccination campaign conducted in 2025 aimed to assess the coverage, and operational performance of the implemented interventions. This evaluation focused on analyzing vaccination coverage in 220 districts, identifying spatial and temporal gaps in implementation, and examining factors influencing campaign performance. The findings of this evaluation provide evidence-based guidance for improving future vaccination strategies, optimizing resource use, and strengthening the overall control and prevention of rabies in Tunisia.
Epidemiology, surveillance, risk assessment, (true)	National survey on brucellosis in cattle	In 2025, the CNVZ, in collaboration with the Tunisian Veterinary School, conducted a national survey on bovine brucellosis. The main objective of this survey was to estimate the true prevalence of brucellosis in cattle, in order to provide robust evidence to inform and update disease control measures. This survey was carried out as part of the ongoing revision of the national strategy for the control of bovine brucellosis.
Zoonoses (true)	Molecular detection of the abortive agents in ruminants	The abortion surveillance system, established in 2019, aimed to identify the causes of abortion in ruminants using PCR techniques and to monitor the prevalence of abortive agents. In 2025, this system revealed the circulation of several pathogens, including Brucella spp., Chlamydia abortus and Coxiella burnetii.
Wildlife (true)	gazelles mortality	Within the framework of the agreement with the General Directorate of Forests, a field investigation was conducted to assess mortality and emaciation in gazelles at Sidi Tioui National Park, Médenine governorate. This study was carried out in collaboration with the General Directorate of Veterinary Services (DGSV) and the Arid Regions Institute (IRA) of Médenine, and in coordination with the Regional Agricultural Development

		Commission of Médenine.
Vaccines (true)	risk assessment	A technical evaluation was conducted on veterinary rabies vaccines, focusing on their safety, efficacy, and suitability for use in animal populations. The assessment considered available vaccine types, administration protocols, and storage requirements to provide recommendations for optimizing rabies control programs in the field.
EPIDEIOLOGY SURVEILLANCE RISK ASSESSMENT (true)	Risk mapping of Bluetongue and Rift valley fever	the CNVZ developed several risk maps for vector-borne diseases, namely bluetongue and Rift Valley fever, focusing on periods of elevated risk. The methodology followed a two-step approach. First, the probability of vector presence was mapped using a Maxent model. This model incorporated key climatic variables, such as temperature and rainfall, together with data on vector presence and absence across selected locations. In the second step, a composite risk map was produced through a Boolean analysis that combined the predicted probability of vector presence with additional risk factors, including animal movement patterns, livestock density, and accessibility. Based on this integration, areas were classified into four risk levels: negligible, low, high, and very high. The elaborated maps were communicated to the veterinary services for prioritizing areas at risk of outbreaks of these vector-borne diseases.
epidemiology, surveillance, risk assessment (true)	Risk mapping of the avian influenza	A query-based spatial analysis, adapted from the CIRAD methodology, was used to assess risk levels. Data on migratory birds and proximity to wetlands were integrated using raster analysis. Boolean rules were applied to combine the different factors and produce a final spatial risk classification.
Wildlife (true)	risk assessment	A field survey was conducted in Sidi Tioui National Park, Médenine governorate, during the annual visit of pilgrims to the sites surrounding the park, which attracts visitors from Tunisia, Libya, and Algeria. The purpose of this survey was to identify the origin of visitors and their animals in order to assess potential risks associated with the introduction or transmission of pathogens that could affect the native wildlife within the park.
Wildlife (true)	mortality of aoudad	CNVZ conducted a field investigation following the mortality of aoudad (mouflons à manchette) in Zaghouan National Park. The objective of this survey was to identify the causes of mortality and to propose potential antiparasitic treatments.
Wildlife (true)	Dorcas gazelles mortality	Within the framework of the agreement with the General Directorate of Forests (DGF), CNVZ conducted a field investigation following mortality events in Dorcas gazelles at Jebel Sarj National Park, Siliana. The objective of this survey was to determine the causes of mortality in the affected population.
vaccines (true)	risk assessment	A technical evaluation was conducted on a Foot-and-Mouth Disease (FMD) vaccine, focusing on its safety, immunogenicity, and suitability for use in livestock populations.
epidemiology, surveillance, risk assessment (true)	risk assessment	A risk assessment was conducted to evaluate the potential introduction of FMD serotype SAT1, into Tunisia. The study aimed to identify possible pathways of virus entry, assess the likelihood of introduction. This assessment provides a scientific basis for implementing targeted surveillance, preventive measures, and contingency planning to reduce the risk of FMDV SAT1 incursion.

TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main fucus 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 WOAH?

No

4. Did your Collaborating Centre maintain a network with other WOAH Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Robert koch institute	Germany	Europa	CNVZ conducted a study with Robert koch institute that focus on the genomes of Brucella melitensis isolated from aborted sheep in Tunisia. The objectives are: (1) to assess the susceptibility of Tunisian B. melitensis isolates to a broad range of antibiotics commonly used for brucellosis treatment, with the aim of evaluating their suitability for human therapy; (2) to investigate the presence of antimicrobial resistance (AMR) and virulence genes within their genomes; and (3) to analyze their genetic relationships with other Tunisian human isolates, global strains, and the Rev1 vaccine strain.
Ecole Nationale des Services Vétérinaires – France Vétérinaire International	france	Europa	Participation as a mentor in the training program offered by Vetagrosup, "E-CERISE"

TOR 4 AND 5: NETWORKING AND COLLABORATION

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

Yes

Name of WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)	United Arab Emirates	Middle East	Develop and validate diagnostic kits for specific camel diseases

TOR 6: EXPERT CONSULTANTS

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

Yes

Name of expert	Kind of consultancy	Subject
SANA KALTHOUM	Review of National Biological Risk Management (BRM) Guidelines for Field Animal Health Service Providers for Kenya	The development of National Biological Risk Management (BRM) Guidelines for Field Animal Health Service Providers

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

develop prevalence and distribution maps for priority diseases (Foot-and-mouth disease (FMD), Peste des Petits Ruminants (PPR), Rift Valley fever (RVF) and brucellosis) based on surveillance data in nine African countries (Kenya, Central African Republic, Niger, Cameroon, Mali, Ethiopia, Burkina Faso, Tanzania, Chad and South Africa) to understand the epidemiological profile of these diseases and to propose areas for improvement.

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

Yes

a) Technical visit : 0

b) Seminars : 1

c) Hands-on training courses: 1

d) Internships (>1 month) : 0

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
B	Advanced animal health economics	France/ Tunisia	60
C	Epidemiological surveillance - GIS, health risk mapping, risk assessment and management	Tunisia	18

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 WOAH?

Yes

National/International	Title of event	Co-organiser	Date	Location	No. Participants
Internationally	Platform,"Ecoregionalisation to support the surveillance and control of Vector Borne Diseases in North Africa, and beyond	IZS Teramo	2025-12-10	on line	1
Internationally	Whole Genome Sequencing (WGS) for Vector-Borne Diseases	IZS Teramo	2025-09-18	on line	1
Internationally	Entomology: use of BG-PRO traps.	IZS Teramo	2025-07-15	on line	1
Internationally	Satellite data: What, where, and how to use them	IZS Teramo	2025-03-18	on line	1

TOR 9: DATA AND INFORMATION DISSEMINATION

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

a) Articles published in peer-reviewed journals:

5

1- Kalthoum, S.; Handous, M.; Kharmachi, H.; Baccar, M.N.; Lachter, M.; Mohamed, B.B.H.; Gharbi, R.; Kachaou, S.; Khoufi, S.; Zaouia, I.; et al. Rabies in Tunisia: a 30-year retrospective study (1994–2023). Front. Trop. Dis. 2026, 6, 1694742, https://doi.org/10.3389/fitd.2025.1694742.

2- Kalthoum S, Handous M, Ben Sliman I, Guesmi K, Hajlaoui H, Khalfaoui W, Ben Mbarek A, Ben Salah C, Bsir M, Oukaili K and Baccar MN (2025) Forecasting dog rabies dynamics in Tunisia using time series models: insights for early warning systems. Front. Trop. Dis. 6:1696368. doi: 10.3389/fitd.2025.1696368

3- Ben Abdallah, I.; Kopprio, G.; Béjaoui, A.; Köhler, S.; Guesmi, K.; Kalthoum, S.; Gatz, J.; Arfaoui, A.; Lachtar, M.; Hajlaoui, H.; et al. Hybrid Whole Genomes of Brucella melitensis from Tunisian Animal Isolates: Virulence Factors, Antimicrobial Susceptibility, and Phylogeny. Microorganisms 2025, 13, 1651. https://doi.org/10.3390/microorganisms13071651

4- Ben Abdallah, I., Guesmi, K., Béjaoui, A., Kalthoum, S., Arfaoui, A., Kessa, H., Hadhiri, S., Issaoui, Z., Ben Smida, B., Jouini, K., Bidhani, M., Toumi, A., Seghaier, C., Baccar, M. N., & Maaroufi, A. (2025). Molecular Detection of Brucella Species Causing Abortion Outbreaks in Ruminant Livestock in Tunisia. International journal of microbiology, 2025, 9941176. https://doi.org/10.1155/ijm/9941176

5- Boukert, R., Foughali, A. A., Saidj, D., Kalthoum, S., Achour, S., & Sahraoui, N. (2025). Epidemiology of cutaneous leishmaniasis in Algeria, 2010–2019. Journal of Parasitic Diseases. https://doi.org/10.1007/s12639-025-01847-7

b) International conferences:

c) National conferences:

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?
- *Implemented updated diagnostic tools and molecular techniques for surveillance of abortion .*

- *Improved data management and analysis workflows for faster and more accurate results by using kobotoolbox in the conducted surveys.*

- *Applied advanced spatial and genomic approaches to study disease patterns (abortion, rabies).*

12. Additional comments regarding your report: