

WOAH Collaborative Centre Reports Activities 2025

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CENTRE INFORMATION

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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 WOA

Category	Title of activity	Scope
Training, capacity building (true)	Training Course for Veterinary Diagnostic Laboratory Network Partners on the Detection and Characterization of Pathogens Causing Major Transboundary Animal Diseases and Zoonoses – Focus on Zoonotic and Vector-Borne Diseases	The course aimed to strengthen participants' skills in diagnosing and monitoring zoonotic and vector-borne diseases of veterinary importance. It focused on advanced molecular and serological techniques to improve disease detection, outbreak response, and the development of effective control strategies.
Diagnosis, biotechnology and laboratory (true)	Molecular epidemiology and genome sequencing study - samples	A total of 491 new samples for molecular characterization and gene sequencing have been received from laboratories in resource-limited settings. These samples represent a diverse range of pathogens, including Lumpy Skin Disease Virus and other poxviruses, African Swine Fever Virus and other porcine viruses, Rabies Virus, Rift Valley Fever Virus, Peste des Petits Ruminants Virus, various avian viruses (such as HPAI, NDV, and IBV), as well as samples designated for metagenomic analyses.
		Candidate irradiated vaccine was developed in Sri

Vaccines (true)	Irradiated vaccines development	Lanka through the support of VetLab network and a coordinated research project against <i>Babesia bigemina</i> in cattle
Training, capacity building (true)	Training Course for Veterinary Diagnostic Laboratory Network Partners on Next Generation Sequencing and Nanopore Sequencing Applications for the Detection and Characterization of Pathogens	The course aimed to strengthen participants' skills in diagnosing and monitoring zoonotic and vector-borne diseases of veterinary importance. It focused on advanced molecular and serological techniques to improve disease detection, outbreak response, and the development of effective control strategies. The purpose of the course was to build participants' capability to generate and analyse pathogen genomic data end to end, from laboratory sample preparation and sequencing to bioinformatic processing, genome assembly, phylogenetic interpretation, and applying these skills to real outbreak investigations.
Training, capacity building (true)	Training Course for Veterinary Diagnostic Laboratory Network Partners: Environmental Surveillance and Monitoring of Pathogens at High-Risk Interfaces	The purpose of this event was to strengthen the ability of Veterinary Diagnostic Laboratory Network (VETLAB) partners to incorporate environmental sampling into their disease-surveillance programmes. The course focused on detecting and monitoring high-priority pathogens at high-risk interfaces.
Training, capacity building (true)	Regional Training Course on Vaccine Quality Control for CBPP and PPR	The purpose of the course was to strengthen Counterpart Institutions' capacity in conventional and molecular vaccine quality-control methods to ensure alignment with international standards. It combined theory and practice to build skills in sterility testing, potency assays, molecular verification, and disease-surveillance support for PPR eradication, CBPP control, and improved vaccine monitoring.
Training, capacity building (true)	Training on Nanopore Sequencing Applications for the Detection and Surveillance of Zoonotic/Animal Diseases	The training aimed to build capacity in using Nanopore sequencing to detect and characterise zoonotic and transboundary animal diseases within the VETLAB and ZODIAC CRP frameworks. It focused on viral family-based amplicon sequencing, metagenomics, and strengthening surveillance and outbreak-response capabilities
Training, capacity building (true)	Training on Nanopore Sequencing Applications for Detection and Surveillance of Zoonotic Pathogens	The training aimed to strengthen capacity in Nanopore-based surveillance of zoonotic pathogens through viral family-based amplicon sequencing and SISPA metagenomics. It supported laboratories in detecting and monitoring emerging diseases
Training, capacity building (true)	Training on Nanopore Sequencing Applications and cross species serology for and Surveillance of Zoonotic Pathogens.	The training aimed to strengthen Ethiopia's capacity for zoonotic-disease surveillance by building skills in Nanopore sequencing and cross-species serological testing. It focused on viral family-based amplicon sequencing and SISPA metagenomics, supporting preparedness and response efforts.
Training, capacity building (true)	Training on Nanopore Sequencing Applications for Detection and Surveillance of Zoonotic Pathogens	The training aimed to strengthen Côte d'Ivoire's capacity for zoonotic-disease surveillance by building skills in Nanopore amplicon sequencing and cross-species serological assays, supporting early detection and control of high-risk pathogens
		The training aimed to enhance Chad's ability to

Training, capacity building (true)	Training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	rapidly detect, diagnose, and monitor high-impact animal and zoonotic pathogens, ultimately supporting improved national surveillance and early warning systems
Training, capacity building (true)	Training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	The event aimed to transfer SOPs and strengthen molecular detection of priority zoonotic and transboundary pathogens through hands-on training in nucleic acid extraction, multiplex assays, qPCR, and result interpretation.
Training, capacity building (true)	Advanced Molecular Diagnostics and NGS Preparedness Training for LANADA	The training aimed to strengthen LANADA's molecular diagnostic capacity by transferring multiplex PCR and NGS sample-preparation SOPs, and providing hands-on instruction in syndromic testing, data analysis, troubleshooting, and instrument support to enhance detection of major livestock diseases
Training, capacity building (true)	Training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	The event aimed to transfer SOPs and strengthen molecular detection of priority zoonotic and transboundary pathogens through hands-on training in nucleic acid extraction, multiplex assays, qPCR, and result interpretation
Training, capacity building (true)	Distribution of laboratory PCR controls, PCR and ELISA reagents, and Standard Operating Procedures (SOPs) for emerging zoonoses	To support the early detection and surveillance of abortifacient bacteria in ruminants, avian influenza virus, mpox virus, and other zoonotic pathogens in veterinary laboratories across endemic and newly affected countries in Asia and Africa
Training, capacity building (true)	Distribution of laboratory PCR controls, PCR and ELISA reagents, and Standard Operating Procedures (SOPs) for major transboundary animal diseases	To support the early detection and surveillance of PPRV (Peste des Petits Ruminants Virus), small ruminant respiratory pathogens, capripoxviruses and other ruminant poxviruses, avian pathogens, African swine fever virus, and other pathogens in veterinary laboratories across endemic and newly affected countries in Asia and Africa
Diagnosis, biotechnology and laboratory (true)	Molecular epidemiology and genome sequencing study sequence analysis	A total of 198 sequences of LSDV (Lumpy Skin Disease Virus), ASFV (African Swine Fever Virus), MPXV (Monkeypox Virus), Avian Influenza Virus, PPRV (Peste des Petits Ruminants Virus), and BPSV (Bovine Papular Stomatitis Virus) were analyzed and made publicly available in the GenBank genetic database.
Diagnosis, biotechnology and laboratory (true)	Design and evaluate multiplex PCR assays for selected zoonotic pathogens, integrating nanopore sequencing for syndromic and species-based animal surveillance.	A panel with indexed primers was evaluated for Viral Hemorrhagic fevers pathogens (Flaviviruses, Bunyaviruses, Filoviruses, Arenaviruses) in collaboration with the Pasteur Institute of Cambodia
Diagnosis, biotechnology and laboratory (true)	Development of a pan-Lyssaviruses LIPS serological assay Whole genome sequence for pathogens characterization	The development of the PAN_Lyssav LIPS assay was completed, with the evaluation of clinical serum samples from various animal species (Dog, cat, bats,). The metagenomic data analysis pipeline was enhanced and incorporated into the Nextflow workflow. In addition, the de novo assembly pipelines were upgraded to enable the extraction of pathogen-specific reads from classification data, followed by de novo assembly using reads generated by MinION Nanopore and PacBio sequencers.
		Scripts were prepared to enhance the visualization of

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Diagnosis, biotechnology and laboratory (true)	Identification of pathogens by metagenomics	metagenomic data. These scripts summarize the top pathogens by read count and present the results as donut plots or stacked bar graphs.
Diagnosis, biotechnology and laboratory (true)	Transfer of family-based assays transferred to Vietnam, Mongolia, Thailand, and Indonesia	The viral family/ genus-based assay for Coronavirus, Flavivirus, Lyssavirus, Orthomyxovirus, Paramyxovirus was adapted with indexed primers and transferred to Thailand, Indonesia, Ivory coast and Ethiopia.
Diagnosis, biotechnology and laboratory (true)	Sanger Sequencing Service for transboundary animal and zoonotic diseases	A standardized multi-step procedure for sequencing services through an external service provider; consists of instructions for sample preparation, evaluation and shipment, sequence assembly and sequence alignment, and development and interpretation of phylogenetic trees of pathogens. In 2025, 3921 samples were submitted from 13 Member State veterinary laboratories using this service.
Diagnosis, biotechnology and laboratory (true)	Whole Genome Sequencing Service for transboundary animal and zoonotic diseases	A standardized multi-step procedure for sequencing services through an external service provider; consists of instructions for sample preparation, evaluation and shipment, sequence assembly and sequence alignment, and development and interpretation of phylogenetic trees of pathogens. In 2025, 591 submitted for 41 pathogens samples were submitted from State veterinary laboratories using this service

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
Organization of inter-laboratory comparison for PPRV	46 laboratories in 39 countries in Africa, Asia, and Europe participated to the ring trial for PPR virus and antibody detection	Laboratory Expertise

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

No

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

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOA?H CC Diagnostic Test Validation Science in the Asia-Pacific Region CSIRO Australian Animal Health Laboratory (AAHL)	Australia	Asia y el Pacífico	Diagnostic tests validation

TOR 4 AND 5: NETWORKING AND COLLABORATION

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

Yes

Name of WOAHP CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOAHP RL for Brucellosis, Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA)	Argentina	Americas	Brucella reference material
WOAHP CC for Quality Control of Veterinary Vaccines, PANVAC	Ethiopia	Africa	Trainings and workshops, scientific collaboration Vaccine quality analysis using NGS and seed sequencing using high fidelity sequencing
WOAHP RL for PPR, CIRAD	France	Europe	PPRV Trainings and laboratory activities
WOAHP RL for PPR, The Pirbright Institute	United Kingdom	Europe	PPRV research and technology transfer
WOAHP RL for Contagious bovine pleuropneumonia, BNVL	Botswana	Americas	Rapid laboratory diagnoses, quality control
WOAHP RL for Avian influenza and Newcastle disease, IZSVe	Italy	Europe	avian influenza and Newcastle disease detection and typing
avian influenza and Newcastle disease detection and typing	Italy	Asia and Pacific	Serological assay development

TOR 6: EXPERT CONSULTANTS

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

Yes

Name of expert	Kind of consultancy	Subject
William D. Dundon	On line	WOAHP PPR Ref LAB Secretariat Meeting 11 November 2025

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Charles Lamien	In person	12th Regional Steering Committee GF-TADs for Africa Mbabane, Eswatini 11-13 March 2025
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TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

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

Yes

Provide access to genome sequencing technology by facilitating access to- and support for- sequencing service providers as well as by sequencing samples upon request of member states.

Provide technical assistance and troubleshooting for ELISA and molecular techniques to national veterinary diagnostic laboratories.

Coordinate and support activities of a global network of national diagnostic veterinary laboratories.

Facilitate access to reference material, maintenance and calibration of laboratory equipment, and external quality assurance for laboratories operating in limited resourced settings.

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

Yes

a) Technical visit : 1

b) Seminars : 460

c) Hands-on training courses: 167

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
B	Webinar of PPR (FAO Indonesia)	Indonesia	460
C	Provided training on detection and Characterization of Pathogens Causing Major Transboundary Animal Diseases and Zoonoses – Focus on Zoonotic and Vector-Borne Diseases	Africa and Asia	33
C	Provided training on Next Generation Sequencing and Nanopore Sequencing Applications for the Detection and Characterization of Pathogens	Africa and Asia	23
C	Provided training on Environmental Surveillance and Monitoring of Pathogens at High-Risk Interfaces	Asia	13
C	Provided training on Vaccine Quality Control for CBPP and PPR	Africa	30
C	Provided training on Advanced Molecular Diagnostics and NGS Preparedness Training for LANADA	Ivory Coast	8

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C	Provided training on Nanopore Sequencing Applications for Detection and Surveillance of Zoonotic Pathogens	Thailand	15
C	Provided training on Nanopore Sequencing Applications for the Detection and Surveillance of Zoonotic/Animal Diseases	Indonesia	8
C	Provided training on Nanopore Sequencing Applications and cross species serology for and Surveillance of Zoonotic Pathogens.	Ethiopia	9
C	Provided training on Nanopore Sequencing Applications for Detection and Surveillance of Zoonotic Pathogen.	Ivory coast	6
C	Provided training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	Chad	8
C	Provided training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	Guinea	4
C	Provided training on Multiplex Real-Time PCR for Priority Animal and Zoonotic Diseases	Mozambique	10
D	Provided training on NGS and Nanopore wet lab workflow	Morocco	1
D	Provided training on NGS and Nanopore data analysis	Morocco	1
D	Advanced Molecular Diagnostics and molecular epidemiology	Mozambique	1
A	Irradiation technologies for vaccine development	Tunisia	12

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:

16

1. Ji, H.J., Jang, A.Y., Han, S.H., Kim, M.K., Lamien, C.E., Wijewardana, V., Ahn, K.B., Kim, K.H., Song, J.Y. and Seo, H.S. (2025) 'Accurate serotype identification of *Streptococcus pneumoniae* using nanopore Cas9 targeted serotype identification (nCATSerotyping)', *Journal of Clinical Microbiology*, e00984 25.
2. Koirala, P., Maharjan, M., Chapagain, S., Sharma, B.K., Settypalli, T.B.K., Lamien, C.E. and Dundon, W.G. (2025) 'Zoonotic implications of the co circulation of clade 2.3.4.4b and 2.3.2.1a H5N1 avian influenza viruses in Nepal in 2023', *Viruses*, 17(11), 1481.
3. Meki, I.K., Ahn, K.B., Dundon, W.G., Settypalli, T.B.K., Leth, C., Steinrigl, A., Revilla Fernández, S., Schmoll, F., Ceglie, L., Berete, K., Metlin, A., Dhingra, M., Nowotny, N., Cattoli, G. and Lamien, C.E. (2025) 'Novel multiplex family wide PCR and Nanopore sequencing of amplicons (FP NSA) for surveillance of influenza and coronaviruses in humans and animals', *Genome Medicine*, 17(1), 123.
4. Beyit, A.D., Yahya, B., Ebou, M.H., Mekhalla, L.O., Haki, M.L., N'diay, F.B., Baba, D., Habiboullah, H., Diop, D.M., Settypalli, T.B.K., Lamien, C.E. and Dundon, W.G. (2025) 'Detection and characterization of avian influenza H9N2 in a broiler farm in Mauritania (2024)', *Veterinary Research Communications*, 49(5), 272.
5. Odoom, T., Abbiw, R.K., Blavo, D.L.M., Johnson, S.A.M., Ababio, P., Dugbartey, S., Meki, I.K., Settypalli, T.B.K., Dundon, W.G. and Lamien, C.E. (2025) 'First molecular characterization of sheep pox viruses in Northern Ghana (2023)', *Viruses*, 17(7), 875.
6. Odoom, T., Abbiw, R.K., Abuh, J.K., Allegye Cudjoe, E., Johnson, S.A.M., Tasiame, W., Arthur, D., Anderson, B., Settypalli, T.B.K., Lamien, C.E. and Dundon, W.G. (2025) 'Case report: Molecular characterization of rabies virus transmitted from a dog to a bull in a livestock market in Ghana', *Frontiers in Veterinary Science*, 12, 1524562.
7. Daniel, S., Moraes, A.P.D., Meki, I.K., Settypalli, T.B.K., Lamien, C.E., Aikukutu, G., Khaïseb, S., Dundon, W.G. and Kabajani, J. (2025) 'Characterization of African swine fever virus in Angola (2024)', *Veterinary Research Communications*, 49(3), 154.
8. Mejri, S., Ayari Fakhfakh, S.E., Ourabi, M., Abid, A., Zaghouni, R., Nouassri, M., Mhiri, S., Gallah, S., Habboubi, N., Hosni, K., Abidi, N., Braiki, N., Mouelhi, W., Ben Slimene, I., Ghodhbene, I., Mhamdi, H., Ksontini, M., Landolsi, Z., Zribi, N., Hamdouni, M., Gamdou, H., Zammel, F., Hlel, A., Ben Harrath, N., Sbai, S., Thabet, S., Ouled Ahmed, H., Sghaier, S., Khorchani, R., Settypalli, T.B.K., Meki, I.K., Lamien, C.E. and Tlatli, A. (2025) 'First detection of lumpy skin disease virus in Tunisia', *Frontiers in Virology*, 5, 1548475.
9. Auer, A., Yohana, A.S., Settypalli, T.B.K., Sallu, R., Chang'a, J., Bitanyi, S., Kiambi, S.G., Meki, I.K., Dundon, W.G., Metlin, A., Rozstalnyy, A., Mbata, G.H., Okachu, J.A., Magwisha, H., Hamis, S.A., Choga, J.T., Chalo, S.L., Kimutai, J., Misinzo, G., Nong'ona, S.W., Lyimo, J.E. and Lamien, C.E. (2025) 'Farming practices, biosecurity gaps, and genetic insights into African swine fever virus in the Iringa and Ruvuma regions of Tanzania', *Animals*, 15(7), 1007.
10. Sharma, P.M., Wangchuk, P., Tshering, D., La, T., Rinchen, S., Thapa, N.K., Settypalli, T.B.K., Dundon, W.G., Meki, I.K. and Lamien, C.E. (2025) 'Molecular characterization and epidemiology of lumpy skin disease virus in Bhutan (2023)', *Transboundary and Emerging Diseases*, 2025(1), 8634585.
11. Meki, I.K., Adedeji, A.J., Ouoba, L.B., Koffi, Y.M., Diakité, A., Settypalli, T.B.K., Habibata Zerbo, L., Kouakou, K.V., Diakit, M.A., Sidi, M., Douyeri, T.O., Dembel, F., Masembe, C., Luka, H.E., Hamidou Ouandaogo, S., Dembel, C., Weka, R., Bazimo, G., Dakouo, M., Olubade, T.A., Guitti Kindo, M., Traoré, C., Gamra, O., Guigma, D. and Sidib, C.A.K. (2025) 'Detection of African swine fever virus genotype II in West Africa (2020) and its co circulation with endemic genotype I', *Transboundary and Emerging Diseases*, 2025(1), 5396227.
12. Molini, U., Coetzee, L.M., Hemberger, M.Y., Jago, M., Khaïseb, S., Shapwa, K., Lorusso, A., Cattoli, G., Dundon, W.G. and Franzo, G. (2025) 'Bovine coronavirus presence in domestic bovine and antelopes sub Saharan Africa: evidence from Namibia', *BMC Veterinary Research*, 21(1), 170.
13. Molini, U., de Villiers, L., Coetzee, L.M., Green, H.P., de Villiers, M., Khaïseb, S., Cattoli, G., Dundon, W.G. and Franzo, G. (2025) 'Further evidence of the host plasticity of porcine circovirus 2: detection of the virus in domestic dogs in Namibia', *BMC Veterinary Research*, 21(1), 162.
14. Weerasekara, W.M.G.K., Dhananjaya, W.M.C., Ashinika, W.M.D., Wijewardana, V., Kangethe, R.T., Kalupahana, A.W. and Mahakapuge, T.A.N. (2025) 'Seroprevalence of bovine viral diarrhoea virus (BVDV) in cattle in the Northern, Northcentral, Central, and Southern provinces of Sri Lanka', *Frontiers in Veterinary Science*, 12.
15. Chérif, N., Ghedira, K., Agrebi, H., Najahi, S., Mejri, H., Azouz, S., Kielbasa, M., Armengaud, J., Kangethe, R.T., Wijewardana, V., Bouhaouala Zahar, B. and Sghaier, H. (2025) 'Proteomic profiling of the serological response to a chemically inactivated nodavirus vaccine in European sea bass *Dicentrarchus labrax*', *Veterinary Research Communications*, 49(3), 125.
16. Belay, E., Bitew, M., Ibrahim, S.M., Dessalegn, B., Abey, S.L., Dejene, H., Birhan, M., Duffera, D., Asefa, E., Tesfaw, L., Abayneh, T., Sherefa, K., W/Medhin, W., Tesfaye, Y., Tuki, K., Gelaye, E., Kangethe, R.T., Wijewardana, V. and Bravo De Rueda, C. (2025) 'Gamma irradiated fowl cholera vaccines formulated with different adjuvants induced antibody response and cytokine expression in chickens', *Frontiers in Immunology*, 16, 1513443.

b) International conferences:

5

1. Sun, Chaoying et al. (2025). GMCSF-enhanced PRRSV titration in Marc145 cells and immunogenic potential of irradiated PRRSV in vitro. Poster, 14th International Veterinary Immunology Symposium (IVIS2025), Vienna, Austria
2. Kangethe Richard et al. (2025). Advancing livestock vaccine development through irradiation at the FAO/IAEA Seibersdorf Laboratories. Poster, 14th International Veterinary Immunology Symposium (IVIS2025), Vienna, Austria
3. Odoom, T., Abbiw, R. K., Abuh, J. K., Arthur, D., Anderson, B., Allegye-Cudjoe, E., Johnson, S. A. M., Tasiame, W., Settypalli, T. B. K., Lamien, C. E., & Dundon, W. G. (2025). Molecular characterization of rabies virus transmitted from a dog to a bull in a livestock market in Ghana. ISWAVLD 205, Calgary, Canada
4. Berguido et al. 2025. Development of a Luminex Assay for Detection of Anti-Capripoxvirus and Rift Valley Fever Virus Antibodies in Domestic Ruminants. Poster, 11th European Meeting on Viral Zoonoses, September 20-23, 2025, St. Raphaël, France
5. Fomsgaard et al, 2025. Field-Deployable Genomic Surveillance for Parallel Detection of High-Risk Viruses and Animal Hosts. Oral Presentation, 44th Annual Meeting of the American Society for Virology

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?

12. Additional comments regarding your report: