WOAH Reference Laboratory Reports Activities 2023

Activities in 2023

This report has been submitted : 12 juillet 2024 15:37

Laboratory Information

Name of disease (or topic) for which you are a designated WOAH Reference Laboratory:	Rabies
Address of laboratory:	1600 Clifton Road, NE, Atlanta, GA 30 333 UNITED STATES OF AMERICA
Tel.:	4046391050
E-mail address:	rabies@cdc.gov
Website:	https://www.cdc.gov/rabies/
Name (including Title) of Head of Laboratory (Responsible Official):	Christina Hutson PhD, MS, Branch Chief, Poxvirus and Rabies Branch
Name (including Title and Position) of WOAH Reference Expert:	Ryan Wallace, DVM, MPH, Veterinary Medical Officer
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

Diagnostic Test	Indicated in WOAH Manual (Yes/No)	Total number of test performed last year	
Indirect diagnostic tests		Nationally	Internationally
IHC		16	0
Antigenic typing		86	0
Sequencing		450	0
Direct diagnostic tests		Nationally	Internationally
DFA		317	0
DRIT		0	0
RT PCR		500	53
RFFIT		1790	0

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

TYPE OF REAGENT AVAILABLE	RELATED DIAGNOSTIC TEST	PRODUCED/ PROVIDE	AMOUNT SUPPLIED NATIONALLY (ML, MG)	AMOUNT SUPPLIED INTERNATIONALLY (ML, MG)	NO. OF RECIPIENT WOAH MEMBER COUNTRIES	COUNTRY OF RECIPIENTS
Low Glycerol Mounting						UNITED STATES OF

Medium	DFA	Provided	80 mL	80 mL	1	AMERICA,
FITC Anti Rabies Monoclonal Globulin	DFA	Provided	45 mL	35 mL	2	ETHIOPIA, UNITED STATES OF AMERICA,
Positive Control Brain Impression Slides (4 wells different RVV) For training and OA	DFA	Produced and provided	671 mL	0	1	UNITED STATES OF AMERICA,
PBS Packets	DFA	Provided	100 mL	400 mL	2	ETHIOPIA, UNITED STATES OF AMERICA,
LN34 Primers and Probes	RABV PCR (LN34)	Produced and provided	0	33 kits	2	GERMANY, ZAMBIA,
Positive control RNA	RABV PCR (LN34)	Produced and provided	0	33 tubes	2	GERMANY, ZAMBIA,
RABV primers	RABV PCR (LN34)	Produced and provided	0	1 panel	2	GERMANY, ZAMBIA,
CDC Biotinylated Monoclonal Antibodies Reagent 1 (For Lyssavirus rabies virus detection only)	DRIT	Produced and provided	1000 mL	0	1	UNITED STATES OF AMERICA,
Bionote Rapid Rabies Ag Detection Kit (LFD)	Lateral Flow Assay (LFA)	Provided	680	0	3	ETHIOPIA, HAITI, UNITED STATES OF AMERICA,

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to WOAH Members?

Yes

VACCINE NAME	AMOUNT SUPPLIED NATIONALLY	AMOUNT SUPPLIED NATIONALLY (ML, MG)	NAME OF RECIPIENT WOAH MEMBERS
Nobivac (MSD international)	0	30,000 ml	TANZANIA ZAMBIA

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?

Yes

NAME OF THE NEW TEST OR DIAGNOSTIC METHOD DEVELOPED	DESCRIPTION AND REFERENCES (PUBLICATION, WEBSITE, ETC.)
CDC LFD protocol	N/A (pending)

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

TOR4: DIAGNOSTIC TESTING FACILITIES

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

Yes

NAME OF WOAH MEMBER COUNTRY SEEKING ASSISTANCE	DATE	WHICH DIAGNOSTIC TEST USED	NO. SAMPLES RECEIVED FOR PROVISION OF DIAGNOSTIC SUPPORT	NO. SAMPLES RECEIVED FOR PROVISION OF CONFIRMATORY DIAGNOSES
HAITI	2023-08-01	Real time LN34	36	36
ZAMBIA	2023-07-01	Real time LN34	53	53

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

Yes

NAME OF THE WOAH MEMBER COUNTRY RECEIVING A TECHNICAL CONSULTANCY	PURPOSE	HOW THE ADVICE WAS PROVIDED

HAITI	LFA training and lab supplies	Teleconference
GUATEMALA	Protocol and study development, LFA training and evaluation support	In-person training, protocol sharing
CAMBODIA	Surveillance consultation	In-person training, protocol sharing
VIETNAM	Protocol and study development, LFA training and evaluation support	In-person training
ZAMBIA	Nanopore sequencing	In-person training, protocol sharing
ETHIOPIA	Hands on Training DFA, Microscope alignment and LFA using modified Bionote LFD	In-person, protocol sharing, reagents and supplies
COLOMBIA	LN34 assay questions, probe design	Remote technical support
THAILAND	Rabies-respiratory sample collection training consult	Teleconference, protocol sharing
GUINEA	Dog vaccination campaign support	Teleconference
SENEGAL	Surveillance consultation	Teleconference

TOR5: COLLABORATIVE SCIENTIFIC AND TECHNICAL STUDIES

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

Yes

Title of the study	Duration	PURPOSE OF THE STUDY	PARTNERS (INSTITUTIONS)	WOAH MEMBER COUNTRIES INVOLVED OTHER THAN YOUR COUNTRY
Zambia Sequencing	2 years	Characterize rabies virus clades circulating in Zambia	"Innovative Virology Laboratory Research and Innovation Department of the Istituto Zooprofilattico Sperimentale delle Venezie, PD, Italy Central Veterinary Research Institute (CVRI) - Zambia	ZAMBIA
LFD International field evaluation	3 years	Develop and validate a modified rabies LFD protocol for WOAH recognition	Haiti MARDR, Guatemala UVG, Zambia, Vietnam DAH	GUATEMALA HAITI VIETNAM ZAMBIA
Enhancing Zoonotic Respiratory Pathogen Surveillance by Leveraging One Health Capacity for Commonly Prioritized Zoonotic Diseases	3 years	Leverage current rabies surveillance capacity for respiratory zoonoses and other priority zoonoses	Thailand DLD, Vietnam DAH, Mission Rabies NGO	THAILAND VIETNAM
Vietnam Study	7 years	Improving rabies surveillance and bite case management in Vietnam	Vietnam Department of Animal Health	VIETNAM
Haiti/DR Sequencing	9 years	Characterize rabies virus clades circulating in Haiti/DR	Ministry of Health - DR	DOMINICAN (REP.) HAITI
Rabies Surveillance in the United States during	12 months	Annual surveillance report of rabies in domestic and wild animals in the US	Canada, Mexico, United States Department of Agriculture	CANADA MEXICO
REACT Risk Assessment Model	9 months	Develop a model to predict the probaility that an animal is rabid and gain insight into the overall epidemiologic landscape of a project area	Mission Rabies NGO, Zambia MFL, India, Haiti MARDR, Vietnam DAH, Malawi, Cambodia	HAITI INDIA MALAWI VIETNAM ZAMBIA

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

No

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:

Collected rabies surveillance data in domestic and wild animals for 50 states in the United States during 2023. Collected surveillance data from animal investigations in Haiti, Vietnam, India, Malawi, Thailand, Zambia, Peru.

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:

Data is processed for the previous year and published annually. The latest report will be reported in 2024, for 2022 data. The most recent data is available here: https://avmajournals.avma.org/view/journals/javma/261/7/javma.23.02.0081.xml. Surveillance data collected via mobile application is analyzed and distributed to relevant country authorities[https://doi.org/10.3389/fvets.2023.1204839 & https://doi.org/10.3389/fpubh.2023.1150228]. GIS data analyzed to prioritize locations for rabies vaccination planning in Zambia, Guinea, and Cambodia.

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:

15

Nadal, D., Bote, K., Masthi, R., Narayana, A., Ross, Y., Wallace, R., & Abela, B. (2023). Rabies post-exposure prophylaxis delivery to ensure treatment efficacy and increase compliance. IJID one health, 1, 100006. https://doi.org/10.1016/j.ijidoh.2023.100006

Ross, Y. B., Vo, C. D., Bonaparte, S., Phan, M. Q., Nguyen, D. T., Nguyen, T. X., Nguyen, T. T., Orciari, L., Nguyen, T. D., Nguyen, O. K. T., Do, T. T., Dao, A. T. P., REACT Development Team, Wallace, R., & Nguyen, L. V. (2023). Measuring the impact of an integrated bite case management program on the detection of canine rabies cases in Vietnam. Frontiers in public health, 11, 1150228. https://doi.org/10.3389/fpubh.2023.1150228

Müller, T., Wallace, R. M., & Freuling, C. M. (2023). Rabies importation in dogs and reduction of waiting period - The fear for scientifically justified changes. Vaccine, S0264-410X(23)01043-5. Advance online publication. https://doi.org/10.1016/j.vaccine.2023.08.077

Hareza, D. A., Langley, R., Ma, X., Wallace, R., & Rupprecht, C. E. (2023). RABIES IN RODENTS AND LAGOMORPHS IN THE USA, 2011-20. Journal of wildlife diseases, 59(4), 734–742. https://doi.org/10.7589/JWD-D-23-00036

Charniga, K., Nakazawa, Y., Brown, J., Jeon, S., & Wallace, R. M. (2023). Risk of Rabies and Implications for Postexposure Prophylaxis Administration in the US. JAMA network open, 6(6), e2317121. https://doi.org/10.1001/jamanetworkopen.2023.17121

Schrodt, C. A., Dilius, P., Gibson, A. D., Crowdis, K., Fénelon, N., Ross, Y., Bonaparte, S., Gamble, L., Lohr, F., Joseph, H. C., & Wallace, R. M. (2023). Corrigendum: Electronic application for rabies management improves surveillance, data quality, and investigator experience in Haiti. Frontiers in veterinary science, 10, 1204839. https://doi.org/10.3389/fvets.2023.1204839

Bonaparte, S. C., Moodie, J., Undurraga, E. A., & Wallace, R. M. (2023). Evaluation of country infrastructure as an indirect measure of dog-mediated human rabies deaths. Frontiers in veterinary science, 10, 1147543. https://doi.org/10.3389/fvets.2023.1147543

Taylor, E., Prada, J. M., Del Rio Vilas, V., Undurraga, E. A., Wallace, R., & Horton, D. L. (2023). Cost-Effectiveness Analysis of Integrated Bite Case Management and Sustained Dog Vaccination for Rabies Control. The American journal of tropical medicine and hygiene, 109(1), 205–213. https://doi.org/10.4269/ajtmh.22-0308

Tidman, R., Fahrion, A. S., Thumbi, S. M., Wallace, R. M., De Balogh, K., Iwar, V., Yale, G., & Dieuzy-Labaye, I. (2023). United Against Rabies Forum: The first 2 years. Frontiers in public health, 11, 1010071. https://doi.org/10.3389/fpubh.2023.1010071

Kunkel, A., Veytsel, G., Bonaparte, S., Meek, H., Ma, X., Davis, A. J., Bonwitt, J., & Wallace, R. M. (2023). Defining County-Level Terrestrial Rabies Freedom Using the US National Rabies Surveillance System: Surveillance Data Analysis. JMIR public health and surveillance, 9, e43061. https://doi.org/10.2196/43061

Holzbauer, S. M., Schrodt, C. A., Prabhu, R. M., Asch-Kendrick, R. J., Ireland, M., Klumb, C., Firestone, M. J., Liu, G., Harry, K., Ritter, J. M., Levine, M. Z., Orciari, L. A., Wilkins, K., Yager, P., Gigante, C. M., Ellison, J. A., Zhao, H., Niezgoda, M., Li, Y., Levis, R., ... Bonwitt, J. (2023). Fatal Human Rabies Infection With Suspected Host-Mediated Failure of Post-Exposure Prophylaxis Following a Recognized Zoonotic Exposure-Minnesota, 2021. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America, 77(8), 1201–1208. https://doi.org/10.1093/cid/ciad098

Davis, A. J., Gagnier, M., Massé, A., Nelson, K. M., Kirby, J. D., Wallace, R., Ma, X., Fehlner-Gardiner, C., Chipman, R. B., & Gilbert, A. T. (2023). Raccoon rabies control and elimination in the northeastern U.S. and southern Québec, Canada. Epidemiology and infection, 151, 1–32. Advance online publication. https://doi.org/10.1017/S095026882300047X

Minhaj, F. S., Bonaparte, S. C., Boutelle, C., & Wallace, R. M. (2023). Analysis of available animal testing data to propose peer-derived quantitative thresholds for determining adequate surveillance capacity for rabies. Scientific reports, 13(1), 3986. https://doi.org/10.1038/s41598-023-30984-3

Ma, X., Bonaparte, S., Corbett, P., Orciari, L. A., Gigante, C. M., Kirby, J. D., Chipman, R. B., Fehlner-Gardiner, C., Thang, C., Cedillo, V. G., Aréchiga-Ceballos, N., Rao, A., & Wallace, R. M. (2023). Rabies surveillance in the United States during 2021. Journal of the American Veterinary Medical Association, 261(7), 1045–1053. https://doi.org/10.2460/javma.23.02.0081

Condori, R.E., Kartskhia, N., Avaliani, L., Donduashvili, M., Elbakidze,T., Kapanadze, A., Pieracci,E.G., Maghlakelidze, G., Ashutosh Wadhwa, A., Morgan, C.N.,Reynolds, M., Yu Li, Y., Ninidze, L. Comparing the genetic typing methods for effective surveillance and rabies control in Georgia. Front. Microbiol., 01 December 2023 https://doi.org/10.3389/fmicb.2023.1243510

b) International conferences:

1
Rabies in the Americas Conference

c) National conferences:

2
Council for State and Territorial Epidemiologist Conference
Epidemic Intelligence Service Conference

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

0

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 : 0

b) Seminars : 1

c) Hands-on training courses: 7

d) Internships (>1 month) 0

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
B	TANZANIA	13
C	HAITI	15
C	GUATEMALA	12
C	CAMBODIA	11
C	VIETNAM	115
C	ZAMBIA	14
C	GUINEA	8
C	ETHIOPIA	12

TOR8: QUALITY ASSURANCE

18. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)	
CLIA	11D0668319	clia-ncezid-atlanta-current-2024SEPT (002).pdf

19. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Orthopox IgG ELISA	CLIA
Rapid Fluorescent Foci Inhibition Test	CLIA
Indirect Fluorescent Antibody Test	CLIA
Direct Fluorescent Antibody test	CLIA
Real Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)	CLIA

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

Yes

CDC Biosafety (OLSS)

TOR9: SCIENTIFIC MEETINGS

21. Did your laboratory organise scientific meetings related to the pathogen in question on behalf of WOAH?

Yes

NATIONAL/ INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	RABLAB Annual Meeting	FLI	2023-12-01	Italy	15
National	National Lab Training Network	KY SPHL	2023-06-01	Frankfurt, KY	8
National	National Lab Training Network	CA SPHL	2023-09-01	Richmond, CA	48

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

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
WOAH East Africa Regional Aquatic and Fisheries Lab. Network Meeting	2023-12-01	virtual	Presenter	Developing and maintaining a national lab network

TOR10: NETWORK WITH WOAH REFERENCE LABORATORIES

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

Yes

24. Do you network (collaborate or share information) with other WOAH Reference Laboratories designated for the same pathogen?

Yes

NETWORK/DISEASE	ROLE OF YOUR LABORATORY (PARTICIPANT, ORGANISER, ETC)	NO. PARTICIPANTS	PARTICIPATING WOAH REF. LABS
RABLAB	Chair	1	12

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?

Yes

TITLE OF THE PROJECT OR CONTRACT	SCOPE	NAME(S) OF RELEVANT WOAH REFERENCE LABORATORIES
Rabies importation in dogs	Rabies importation in dogs and reduction of waiting period - The fear for scientifically justified changes	Institute of Molecular Virology and Cell Biology, Friedrich-Loeffler Institut, Federal Research Institute for Animal Health
Rabies in wildlife along the US Canada border	Raccoon rabies control and elimination in the northeastern U.S. and southern Québec, Canada	Centre of Expertise for Rabies CFIA/ACIA, Ottawa Laboratory Fallowfield, Animal Diseases Research Institute
Rabies surveillance in the United States during 2021	Overview of rabies in Canada and Mexico during 2021	Centre of Expertise for Rabies CFIA/ACIA, Ottawa Laboratory Fallowfield, Animal Diseases Research Institute; Centro Nacional de Servicios de Diagnóstico en Salud Animal

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

Purpose for inter-laboratory	Role of your reference laboratory	No. participating laboratories	Name of the Test	WOAH Member Countries

test comparisons1	(organizer/participant)			
LFD evaluation, validation of protocol	Organizer	9	Bionote Rapid Rabies Ag Canine Test Kit	GUATEMALA, HAITI, UNITED STATES OF AMERICA, VIETNAM, ZAMBIA,
Bi-annual DFA-PT Wisconsin State Laboratory of Hygiene	Participant	115	DFA	UNITED STATES OF AMERICA,

TOR12: EXPERT CONSULTANTS

28. Did your laboratory place expert consultants at the disposal of WOAH?

Yes

KIND OF CONSULTANCY	Location	SUBJECT (FACULTATIVE)
Ad hoc group meetings	Virtual	2023 WOAH ad hoc Group on the endorsement of dog-mediated rabies official control programmes
Technical Paper	Virtual	LFD
Review of standards	Virtual	Non-adoption of the Code amendments to reducing the waiting period from 90 to 30 days
Review of standards	Virtual	4.1.2. Chapter 8.14. Infection with rabies virus – you will note that amendment of Chapter 8.14. is proposed for adoption in May 2023.

29. Additional comments regarding your report:

No