OIE Reference Laboratory Reports Activities

Activities in 2021

This report has been submitted : 2022-01-25 21:18:30

Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Rabies
Address of laboratory:	1600 Clifton Road, NE, Mail Stop H15-1 Atlanta, GA 30 333 UNITED STATES OF AMERICA
Tel.:	+1-404 639.10.50
Fax:	+1-404 639.15.64
E-mail address:	euk5@cdc.gov
Website:	www.cdc.gov/rabies
Name (including Title) of Head of Laboratory (Responsible Official):	David Lowe, PhD, Lead, Quality Management Team
Name (including Title and Position) of OIE Reference Expert:	Ryan Wallace, DVM, MPH, Veterinary Medical Officer
Which of the following defines your laboratory? Check all that apply:	Governmental

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
IHC	Yes	15	0
Sequencing	Yes	46	1
Direct diagnostic tests		Nationally	Internationally
DFA	Yes	164	2
DRIT	Yes	9	0
RT PCR	Yes	106	2
RFFIT	Yes	2	134

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
RT-PCR LN34 Reagents kits	RT PCR	Produced	20 kits	22 kits	6	☐Africa ☒Americas ☒Asia and Pacific ☐Europe ☐Middle East
Rabies RNA panel kit	RT PCR	Produced	1 kit	2 kits	3	☐Africa ☒Americas ☐Asia and Pacific ☒Europe ☐Middle East
AgPathID real-time PCR kit	RT PCR	Provided	0 kits	2 kits	2	☐Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East
Directzol RNA extraction kit	RT PCR	Provided	0kits	2 kits	2	☐Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East
FDI Anti-rabies Conjugate	DFA (FAT)	Provided	0	100ml	2	☒Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East
Millipore Low Glycerol Mounting Medium Cat# 5096	DFA (FAT)	Provided	0	140ml	2	☒Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East

Sigma PBS Packets to prepare 1 L	DFA (FAT)	Provided	0	80 each	2	☒Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East
Millipore DFA reagent Cat# 5100	DFA (FAT)	Provided	5ml	0	1	☐Africa ☒Americas ☐Asia and Pacific ☐Europe ☐Middle East
Biotinylated Anti-rabies Monoclonal Antibodies CDC reagent-1	DRIT	Produced	2020ml			☐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?

Yes

Vaccine name	Amount supplied nationally (ml, mg) (including for own use)	Amount supplied to other countries (ml, mg)	Name of recipient OIE Member Countries
PM virus	0	1ml	MEXICO
Rabies Virus rPV-20161 Strain	0	6ml	PERU

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
TRINIDAD AND TOBAGO	August	0	2
AZERBAIJAN	July	134	

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
HAITI	Assist with laboratory testing, animal and human surveillance, health economics modelling, education for children, and dog vaccination. Provided training on microscope lamp and alignment replacement	Due to the COVID-19 pandemic, all support was provided virtually.
SENEGAL	IBCM implementation LFD field trail	Due to the COVID-19 pandemic, all support was provided virtually.
PERU	Electronic IBCM implementation	Due to the COVID-19 pandemic, all support was provided virtually.
INDIA	Provide technical assistance on dog vaccination, surveillance program to establish canine rabies free zone, and rabies virus sequencing	Due to the COVID-19 pandemic, all support was provided virtually.
ITALY	Consultation on LN34 assay	Due to the COVID-19 pandemic, all support was provided virtually.
ETHIOPIA	Training for reginal labs on basics of Rabies Epidemiological Bulletin, as well as the Rabies Case Surveillance component. Technical assistance regarding microscope troubleshooting, outbreak response and any troubleshooting for assays	Due to the COVID-19 pandemic, all support was provided virtually.
BANGLADESH	Assist with household survey analysis to characterize dog population and bite victims	Due to the COVID-19 pandemic, all support was provided virtually.
VIETNAM	Assist with laboratory testing, human and animal electronic surveillance system expansion	Due to the COVID-19 pandemic, all support was provided virtually.
GUATEMALA	Provide tools to estimate dog populations and vaccination coverage	Due to the COVID-19 pandemic, all support was provided virtually.
ZAMBIA	Provide training for dog vaccination campaign, IBCM implementation, rabies lab evaluation, and LN34 implementation	Due to the COVID-19 pandemic, all support was provided virtually.

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
Rabies surveillance in the United States during 2019.	12 months	Annual surveillance report of rabies in domestic and wild animals in the US.	Canada, Mexico, United States Department of Agriculture	CANADA MEXICO
Evaluating rabies virus phylogenetics in Georgia	3 years	determine enzootic rabies transmission cycles	National Food Agency	GEORGIA
Establishment of Canine Rabies Burden in Vietnam	4 years	Detail the process of developing a surveillance program in Vietnam	Department of Animal Health (Vietnam) and National Institute of Hygiene and Epidemiology (Vietnam)	VIETNAM
Effects of counseling on health care seeking behavior, VN	4 year	Assess the usefulness of IBCM in promoting best practices for PEP	Department of Animal Health (Vietnam) and National Institute of Hygiene and Epidemiology (Vietnam)	VIETNAM
Study of dog populations, Georgia	3 years	Ascertain dog population estimates in study locations	National Food Agency	GEORGIA
Burden in Cambodia	3 years	Detail the process of developing a surveillance program in Cambodia		CAMBODIA
Implementation and Evaluation of Rabies Electronic Integrated Bite Case Management in a Low-Resource Country	4 years	transition to eIBCM surveillance in Haiti	Ministry of Agriculture, Natural Resources and Rural Development	HAITI

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:
Collected rabies surveillance data in domestic and wild animals for 50 states in the United States during 2021. Collected surveillance data from animal investigations in Haiti, Vietnam, India, Malawi, Sri Lanka, Thailand, and Cambodia . Bioinformatics analysis for rabies virus sequence data in India.

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:
Data is processed for the previous year and published annually. The latest report will be reported in 2022, for 2020 data. The most recent data is available here: Rabies surveillance in the United States during 2018. https://avmajournals.avma.org/view/journals/javma/258/11/javma.258.11.1205.xml Surveillance data collected via mobile application is analyzed and distributed to relevant country authorizes monthly in Haiti and India. GIS data analyzed to prioritize locations for rabies vaccination planning in Zambia Surveillance data collected has been analyzed and used to model the potential effects of an interrupted dog vaccination program in Haiti and human rabies deaths due to bat exposures in the United States. Risk of rabies importation in dogs thirty days after demonstration of adequate serum antibody titer. Bite Injuries among Vaccination Staff Participating in a Mass Canine Rabies Vaccination Campaign, Haiti.

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: 10

Ma, X., Monroe, B. P., Wallace, R. M., Orciari, L. A., Gigante, C. M., Kirby, J. D., Chipman, R. B., Fehlner-Gardiner, C., Cedillo, V. G., Petersen, B. W., Olson, V., & Bonwitt, J. (2021). Rabies surveillance in the United States during 2019. Journal of the American Veterinary Medical Association, 258(11), 1205–1220. https://doi.org/10.2460/javma.258.11.1205

Bonaparte, S. C., Adams, L., Bakamutumaho, B., Barbosa Costa, G., Cleaton, J. M., Gilbert, A. T., Osinubi, M., Pieracci, E. G., Recuenco, S., Tugumizemu, V., Wamala, J., & Wallace, R. M. (2021). Rabies post-exposure healthcare-seeking behaviors and perceptions: Results from a knowledge, attitudes, and practices survey, Uganda, 2013. PloS one, 16(6), e0251702. https://doi.org/10.1371/journal.pone.0251702

Kunkel, A., Jeon, S., Joseph, H. C., Dilius, P., Crowdis, K., Meltzer, M. I., & Wallace, R. (2021). The urgency of resuming disrupted dog rabies vaccination campaigns: a modeling and cost-effectiveness analysis. Scientific reports, 11(1), 12476. https://doi.org/10.1038/s41598-021-92067-5

Browne, A. S., Cranford, H. M., Morgan, C. N., Ellison, J. A., Berentsen, A., Wiese, N., Medley, A., Rossow, J., Jankelunas, L., McKinley, A. S., Lombard, C. D., Angeli, N. F., Kelley, T., Valiulus, J., Bradford, B., Burke-France, V. J., Harrison, C. J., Guendel, I., Taylor, M., Blanchard, G. L., … Ellis, E. M. (2021). Determination of freedom-from-rabies for small Indian mongoose populations in the United States Virgin Islands, 2019-2020. PLoS neglected tropical diseases, 15(7), e0009536. https://doi.org/10.1371/journal.pntd.0009536

Kunkel, A., Minhaj, F. S., Whitehill, F., Austin, C., Hahn, C., Kieffer, A. J., Mendez, L., Miller, J., Tengelsen, L. A., Gigante, C. M., Orciari, L. A., Rao, A. K., & Wallace, R. M. (2022). Notes from the Field: Three Human Rabies Deaths Attributed to Bat Exposures - United States, August 2021. MMWR. Morbidity and mortality weekly report, 71(1), 31–32. https://doi.org/10.15585/mmwr.mm7101a5

Monroe, B., Ludder, F., Dilius, P., Crowdis, K., Lohr, F., Cleaton, J., Gamble, L., Blanton, J., Etheart, M., Pieracci, E. G., Natal Vigilato, M. A., Molina-Flores, B., Millien, M., Gibson, A. D., & Wallace, R. M. (2021). Every Dog Has Its Data: Evaluation of a Technology-Aided Canine Rabies Vaccination Campaign to Implement a Microplanning Approach. Frontiers in public health, 9, 757668. https://doi.org/10.3389/fpubh.2021.757668

Scott, T. P., Sharma, S. K., Wallace, R. M., Nel, L. H., Adhikari, S. K., Abela-Ridder, B., & Thumbi, S. M. (2021).

Assessing the practicalities of joint snakebite and dog rabies control programs: Commonalities and potential pitfalls. Toxicon: X, 12, 100084. https://doi.org/10.1016/j.toxcx.2021.100084

Smith, T. G., Fooks, A. R., Moore, S. M., Freuling, C. M., Müller, T., Torres, G., & Wallace, R. M. (2021). Negligible risk of rabies importation in dogs thirty days after demonstration of adequate serum antibody titer. Vaccine, 39(18), 2496–2499. https://doi.org/10.1016/j.vaccine.2021.03.064

Kirkhope, R. T., Gibson, A. D., Augustin, P. D., Crowdis, K., Fénelon, N., MacLeod, E. T., Vigilato, M., Pieracci, E. G., & Wallace, R. M. (2021). Bite Injuries among Vaccination Staff Participating in a Mass Canine Rabies Vaccination Campaign, Haiti 2016-2017. The American journal of tropical medicine and hygiene, 105(6), 1582–1589. https://doi.org/10.4269/ajtmh.21-0241

Pieracci, E. G., Williams, C. E., Wallace, R. M., Kalapura, C. R., & Brown, C. M. (2021). U.S. dog importations during the COVID-19 pandemic: Do we have an erupting problem?. PloS one, 16(9), e0254287. https://doi.org/10.1371/journal.pone.0254287

b) International conferences: 3
Rabies in the Americas Conference
Vampire Bat working group
ICEID

c) National conferences: 3
American Veterinary Medical Association
U.S. Department of Agriculture meeting
US Animal Health Association

d) Other:
(Provide website address or link to appropriate information) 0

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: 2
c) Hands-on training courses: 2
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	Zambia	15
b	Thailand	10
c	Haiti	7
c	Guatemala	5

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)
CLIA	2020-2022_CLIA Cert_NCEZID_11D0668319.pdf
ISO17025	A2LA ISO17025 certificate.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
Orthopox IgG ELISA	A2LA-ISO17025
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

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	OIE RabLab	Thomas Muller	05/21	Virtual	12

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
World Rabies Day	09/21	Virtual	Speaker	Rabies Surveillance in the United States
Rabies in the Americas Conference	10/21	Virtual	Speaker	Assessment of international rabies risk classifications and adequate control for dog importation; A Multi-State Investigation of the Importation of a Rabid Dog to the United States from Azerbaijan, 2021; Outbreak of raccoon rabies virus variant in foxes: Sagadahoc County, Maine, USA

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?

Yes

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?

Yes

Title of the project or contract	Scope	Name(s) of relevant OIE Reference Laboratories
LN34 Implementation in Thailand	ordinated with the CDC country office in Thailand to consult with national and regional rabies laboratories to gauge their interest in implementing the LN34 assay	Thailand
Negligible risk of rabies importation in dogs thirty days after demonstration of adequate serum antibody titer	Determine if evidence supports a reduced waiting period from 90 to 30 days following proof of adequate rVNA in a healthy dog.	Animal and Plant Health Agency; Institute of Molecular Virology and Cell Biology, Friedrich-Loeffler Institute

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
Participated in external DFA assessment	2	☐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?

Yes

Kind of consultancy	Location	Subject (facultative)
Technical consultancy	Virtual	OIE ad hoc vaccine group tender
Technical consultancy	Virtual	Global Laboratory Leaders Program – Animal Subgroup
Technical consultancy	Virtual	Rabies Reference Laboratory Network (RABLAB)

25. Additional comments regarding your report: