

OIE Virtual Workshop on Oral Rabies Vaccines (ORVs)¹

28 February 2022, Tokyo Japan

WORKSHOP REPORT

SUMMARY

The OIE organized a virtual workshop on Oral Rabies Vaccines (ORVs) on 28 February 2022. The workshop was attended by 125 participants from 21 Members in the Asia-Pacific region representing veterinary services, veterinary schools, non-governmental agencies and other institutions working on rabies control. The renowned experts from the OIE Reference Laboratories in Germany and India, OIE headquarters, US-CDC, Mission Rabies, and Kasetsart University of Thailand made presentations on different cross cutting issues of ORVs which outlined the latest updates to the various aspects of the ORV, including the concept of ORV and their use in wildlife, proof of concept for use in dogs, safety and effectiveness based on field tests, production and supply chain, OIE standards of ORVs and status of ORVs usage in the area. This workshop provided a platform for presenting and discussing the potential role of ORV in complementing parenteral rabies vaccination, especially in areas where free roaming dogs are the main reservoir of rabies virus. The workshop stressed the opportunities and challenges of using ORVs in dogs, including issues related to licensing and registration, safety, efficacy, costs, and availability of ORVs.

BACKGROUND AND INTRODUCTION

The OIE workshop on Oral Rabies Vaccines (ORVs) was held on 28 February 2022 at 3 pm Japan time through virtual platform. The workshop was organized with the following objectives:

- To enhance awareness of oral rabies vaccination principles, concepts, use in wildlife, and potential use in dogs for rabies elimination;
- To share country experiences of successful piloting of ORV baits and ORVs in dogs;

¹ This report was prepared by Nure Alam Siddiky, Consultant, One Health, OIE RRAP in consultation with Kinzang Dukpa, Regional Project Coordinator (One Health), OIE RRAP



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- To create a platform for communication among countries, OIE, experts, and vaccine manufacturers for those interested in piloting ORVs in dogs;
- To discuss key issues and gaps hindering uptake of ORVs in the region that could be addressed through regional or country-specific interventions collaboratively with partners, experts, vaccine manufacturers, and/or other stakeholders;

The presentations in the workshop were organized in consistent with the two thematic areas, (i) ORVs and its usage in controlling sylvatic rabies; and (ii) Can ORVs be the solution for control of canine-mediated rabies in Asia?

In alignment with the first thematic area, presentations were made on epidemiology of rabies, concept of ORVs, safety and efficacy of ORVs and supply and distribution issues. Similarly, under second thematic area, presentations were made on status of use of ORVs in Asia, role of ORVs in eliminating dog mediated human rabies, suitability of bait in context of Asia and safety & efficacy of ORVs in field conditions.

The workshop was attended by 125 participants representing national veterinary services, veterinary schools, NGOs, and other agencies working on rabies control from 21 Members in the Asia Pacific region (Table 2). The experts from the OIE Reference Laboratories in Germany and India, OIE headquarters, US-CDC, Mission Rabies, and Kasetsart University of Thailand provided latest updates on various aspects of ORVs such as the concepts of ORVs and its usage in wildlife; proof of concept for use in dogs; its safety and efficacy based on field trials; production and supply chains; OIE standards of ORVs; and status of use of ORVs in the region.

KEY POINTS DISCUSSED IN THE WORKSHOP

The following key points has been discussed in the workshops

1. ORV can play a vital role in the fight against rabies and offers a new tool to help save lives now and reach the goal of eliminating human rabies deaths caused by dogs by 2030;
2. ORVs have been used successfully in eliminating sylvatic rabies from the wildlife reservoirs (red foxes, raccoons, etc.) in North America and Europe;
3. ORVs could contribute significantly in improving the vaccination coverage of the free-roaming dogs considered inaccessible for parenteral vaccination;
4. Sri Lanka, Thailand and India have previously piloted ORVs, and Indonesia is currently piloting; (For details see Table 1)



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5. The ORV baits must be attractive, cheap, safe (to both targeted and non-targeted species), palatable and easy for release of vaccine in the oral cavity;
6. The egg mediated baits were found more acceptable, palatable and feasible in the region;
7. Although use of ORVs in wild animals in terms of safety, efficacy and stability are well studied, there is still a paucity of data for use of ORVs in domestic animals including dogs. Therefore, there is a need for more pilot studies to provide more data to build confidence based on science;
8. All commercial ORVs have to comply with international standards including OIE standards as per OIE Terrestrial Manual;
9. ORVs is more cost effective than parenteral vaccination as free roaming dogs form the bulk of the population;
10. The administration of ORVs is much easier and more practical than capturing the dog in nets and giving them rabies vaccines;

CHALLENGES OF ORVS PILOTING

The workshop identified some challenges for ORVs piloting

1. None of the currently available commercial ORVs are licensed for use in dogs and therefore import permit may be an issue;
2. National regulatory system for imports of ORVs and ORV baits;
3. Integration of ORVs with national vaccination campaign;
4. Acceptance of oral rabies vaccination by the community given the live nature of the vaccine;
5. Selection of palatable and preferable bait for the particular community of dogs;
6. Availability of cost effective and thermostable ORVs in the region;
7. To increase the success rate of ORVs in the inaccessible free roaming dogs;
8. Country capacities in implementing ORVs and willingness to take lead in piloting;
9. ORVs are of higher costs as compared with parenteral vaccines thus initial costs may be high;
10. Difficulties in tracing vaccinated dogs for assessing immunity and any other follow up interventions;
11. Cold chain management of the vaccines at the field level;



WORKSHOP MATERIALS

Presentations and other materials related to this workshop are available at the OIE Regional Representation website, <https://rr-asia.oie.int/en/events/oie-virtual-workshop-on-oral-rabies-vaccines/>

Table 1: List of ORVs piloted in dogs in Asia

Type	Vaccine Strain	Vaccine Name and Manufacturer	Species	Year In Use	Countries in which trial conducted	Reference
Modified Live (1 st generation)	SAD B19	Fuchsoral, Ceva, France	Dog	2001	Philippines	Estrada et al., 2001
Modified Live (2 nd generation)	SAG 2	RABIGEN® Virbac, France	Dog	2007	India	Cliquet et al., 2007
Modified Live (3 rd generation)	SPBN GASGAS	Rabitec® Ceva, France	Dog	2020	Thailand	Leelahapongsathon et al., 2020
Vector-based (Vaccinia virus)	V-RG	Raboral V-RG® Boehringer Ingelheim, Germany	Dog	2000	Sri Lanka	Perera et al., 2000
Modified Live (3 rd generation)	SPBN GASGAS	Rabitec® Ceva, France	Dog	2022	Indonesia	Trial is ongoing

Table 2: List of participants who attended the workshop

Nominated participants

Country	Name	Designation and Affiliation
Australia	Dr Rob Atkinson	-
Australia	Dr Gary He	-
Bangladesh	Dr Sukes Chandra Badhy	ULO (L/R), Central Disease Investigation Laboratory, DLS
Bhutan	Dr Karma Wangdi	Deputy Chief Veterinary Officer, AHD DoL
Bhutan	Dr Pelden Wangchuk	Sr. Veterinary Officer, NCAH, Serbithang
Cambodia	Dr Bun Chan	Deputy Director, National Animal Health and Production Research Institute
Cambodia	Mr Ung Bunsong	Vice Chief of Investigation, Surveillance and Control of Animal Disease Office
Cambodia	Mr Hak Sochetra	Vice Chief Management Animal Clinic office
China PR	Dr Ma Jihong	China Animal Disease Control Center
China PR	Dr Yao Qiang	China Animal Disease Control Center



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Country	Name	Designation and Affiliation
Chinese Taipei	Chung-Ching Lin	OIE Wildlife Focal Point and Specialist Animal Health Inspection Division
Chinese Taipei	Tai-Ting Chen	Associate Technical Specialist Animal Health Inspection Division
Fiji	Dr Chaminda Dissanayake	Senior Veterinary Officer
Fiji	Dr Malan Bandara	Veterinarian
India	Dr Aruna Sharma	-
India	Dr Debalina Mitra	-
Indonesia	Pebi Suseno	-
Indonesia	Dr Arif Hukmi	-
Indonesia	Dr Siti Yulianti	-
Indonesia	Dr Ernawati	-
Indonesia	Dr Ratna Vitta Ekowati	-
Iran	Dr Nikkhah	-
Japan	Dr Ken Maeda	National Institute of Infectious Diseases (NIID)
Malaysia	Dr Akma Ngah Hamid	Deputy Director General of Veterinary Health
Malaysia	Dr Sarah Dadang Abdullah	Disease Control and Veterinary Biosecurity Division
Nepal	Dr Sujan Rana	Senior Veterinary Officer, DLS
New Zealand	Andre van Halderen	OIE Coordinator, Ministry for Primary Industries
New Zealand	Baukje Lenting	Science Products, Ministry for Primary Industries
New Zealand	Wendy Newsham	Senior Adviser, Animal Imports, Ministry for Primary Industries
Pakistan	Dr Muhammad Iqbal Shahid	Additional Secretary(Technical) Livestock and Dairy Development Department, Punjab
Philippines	Dr Maria Glovezita O. Lagayan	Rabies Focal Person Animal Health and Welfare Division Bureau of Animal Industry
Philippines	Dr Jeffrey L. Cruz	Head, Rabies Laboratory Animal Disease Diagnosis and Bureau of Animal Industry
Singapore	Dr Lin Anhui	Deputy Director Animal Population Management and Centre for Animal Rehabilitation National Parks Board (NParks)
Singapore	Dr Christine Lee	Veterinarian Centre for Animal & Veterinary Sciences National Parks Board (NParks)
Sri Lanka	Dr M.D.N. Jayaweera	Additional Director General (Animal Health)



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Country	Name	Designation and Affiliation
Sri Lanka	Dr T.P. Wijayathilake	Veterinary Surgeon
Vietnam	Mr Vo Dinh Chuong	Official of Division Animal Epidemiology
Observers		
Australia	Victoria Brookes	Lecturer Evidence-based Practice The University of Sydney Faculty of Science, Sydney School of Veterinary Science
Australia	Dr HyoRyung Lee DVM	Policy Officer, Animal Health Epidemiology and One Health, Animal Health Policy Biosecurity Animal Division +61 2 6271 6361 Department of Agriculture, Water and the Environment GPO Box 858, Canberra ACT 2601 https://awe.gov.au
Australia	Dr Jory Stariwat	AMMRRIC Biosecurity Project Manager
Australia	Dr Bonny Chumming	AMMRRRIC Program Manager - Strategic Delivery
Australia	Dr Malcolm Anderson	The Little Kingfisher Group Biosecurity, One Health & Emergency Response Planning Communication and Training
Australia	Dr Keren Cox-Witton	-
Bangladesh	Dr Palash Sarker	Upazila Livestock Officer Department of Livestock Services,
Bhutan	Dr RB Gurung	Program Director, NCAH
Bhutan	Dr Rinzin Pem	Chief, AHD DoL
Chinese Taipei	Prof. Cheng-Hung Lai	Associate Professor Department of Veterinary Medicine National Chung Hsing University
India	Prof. Shrikrishna Isloor	KVAFSU
India	Dr Sharada, R.	Assistant Professor & Quality Manager, KVAFSU-CVA Rabies Diagnostic Laboratory, OIE Reference Laboratory for Rabies, Department of Veterinary Microbiology, Veterinary College
India	Dr Kavitha, G.	KVAFSU-CVA Rabies Diagnostic Laboratory, OIE Reference Laboratory for Rabies, Department of Veterinary Microbiology, Veterinary College
India	Dr Hridya Susan Varughese,	KVAFSU-CVA Rabies Diagnostic Laboratory, OIE Reference Laboratory for Rabies, Department of Veterinary Microbiology, Veterinary College,



Country	Name	Designation and Affiliation
India	Dr Vinay, C. P.	KVAFSU-CVA Rabies Diagnostic Laboratory, OIE Reference Laboratory for Rabies, Department of Veterinary Microbiology, Veterinary College
India	Dr Tilak Chandan, S.	KVAFSU-CVA Rabies Diagnostic Laboratory, OIE Reference Laboratory for Rabies, Department of Veterinary Microbiology, Veterinary College
India	Dr Nagappa S. Karabasanavar	Associate Professor & Head, Department of Veterinary Public Health & Epidemiology, Karnataka Veterinary, Animal & Fisheries Sciences University
Iran	Dr Maryam Aghazamani	-
Japan	Dr Michiko Harada	National Institute of Infectious Diseases (NIID)
Japan	Dr Hajime Sakaki	National Veterinary Assay Laboratory (NVAL)
Pakistan	Muhammad Haris Khan	UVAS
Philippines	Dr Milagros Mananggit	Regional Rabies Coordinator/Laboratory
Philippines	Dr Marie France Q. Jalao	Regional Rabies Coordinator / Regulatory
Philippines	Dr Daphne L. Jorca	-
Thailand	Karoon Chanachai	USAID Thailand
Thailand	Tippawon Prarakamawongsa	Department of Livestock Development
Japan	Yuri Fujimoto	University of Tokyo
Biogenesis Bago	Juver Membrebe	Asia Technical Service and Regulatory Affairs Manager
Philippines	Dr Oryza Kristy Bisahan	Regional Rabies Coordinator/Laboratory
Chinese Taipei	Fan Lee	-
Chinese Taipei	Chia-Yi Chang	-
Chinese Taipei	Ai-Ping Hsu	-
Chinese Taipei	Shu-Chia Hu	-
Chinese Taipei	Yang-Chang Tu	-
Chinese Taipei	Andrew Chang-Young Fei	Adjunct Professor, School of Veterinary Medicine, National Taiwan University
Chinese Taipei	Jia-Feng Peng	Animal Quarantine Division Bureau of Animal and Plant Health Inspection and Quarantine
France	Dominique THIBAUD	Veterinary Public Health Rabies Programme Lead Ceva Santé Animale
Germany	Sandra Beck	Dossier Scientific Writer -Regulatory Affairs
Sri Lanka	Dr Ashoka Dangolla	-



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Country	Name	Designation and Affiliation
France	Dr Florence Cliquet	European Union Reference Laboratory for Rabies
Philippines	Dr Marie Rachelle Jane C. Cornejo	Faculty, College of Veterinary Medicine Central Bicol State University of Agriculture
Indonesia	drh. M. Daud	AK, M. Si
Indonesia	Drh Dedi Rahmat Setiadi	M. Si Faculty of Veterinary Medicine IPB University
Indonesia	Drh Aprilia Hardiati	M. Si Faculty of Veterinary Medicine IPB University
Indonesia	Drh Diah Nugrahani Pristihadi	Faculty of Veterinary Medicine IPB University
Sri Lanka	Dr Manjula Jayasingha	Veterinary Medicine and Animal Science University of Peradeniya
Philippines	Dr Maria Catalina T. De Luna	College of Veterinary Medicine University of the Philippines Los Baños
Philippines	Dr Marrienne Leila S. Flores	College of Veterinary Medicine University of the Philippines Los Baños
Hong Kong	Dr Anne Conan	Research Assistant Professor Centre for Applied One Health City University of Hong Kong
Malaysia	Dr Farina Mustaffa	Virologist Faculty of Veterinary Medicine, UPM Universiti Putra Malaysia
Vietnam	Dr Nguen Ba Tiep	Faculty of Veterinary Medicine Vietnam National University of Agriculture
Pakistan	Dr Aqsa Mushtaq	Senior veterinary officer Veterinary Research Institute Lahore Pakistan
Bangladesh	Dr Palash Sarker	Upazila Livestock Officer Department of Livestock Services
Iran	Ali Es-haghi	-
FAO	Wahid Fakhri Husein	-
Sri Lanka	Dr Kavindra Wijesundera	Senior Lecturer, Department of Veterinary Pathobiology Faculty of Veterinary Medicine and Animal Science, University of Peradeniya
Thailand	Dr Suwicha Kasemsuwan,	Associate Professor, Kasetsart University
Philippines	Dr Mary Ruth Callanta	Regional Rabies Coordinator/Laboratory
Chinese Taipei	Yu Chia Chang	informed by schu@mail.nvri.gov.tw
France	Katharina BOBE	Scientist - I&D Ceva
Philippines	Dr Ilene Basitan-Mirabeles	-
Sri Lanka	Prof KAN Wijewardena	Veterinary Medicine and Animal Science University of Peradeniya
Mission Rabies	Dr Amy Lewis	Mission Rabies
Mission Rabies	Dr Balaji Chandrashekar	Mission Rabies



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Country	Name	Designation and Affiliation
Mission Rabies	Dr Jordana Bailey	Mission Rabies
Mission Rabies	Dr Ilona Otter	WVS
Mission Rabies	Dr Pubudu De Silva	Ministry of Health, Sri Lanka
Mission Rabies	Frederic Lohr	-
Myanmar	Hlaing Hlaing Myint	-
Myanmar	YE HTUT AUNG (YE HTUT AUNG)	-
Pakistan	Dr Hammad Ahmed	-
Malaysia	Siew Lee Yap	-
Speakers		
Germany	Dr Thomas Müller	Friedrich-Loeffler Institut Laborleiter Institut für molekulare Virologie und Zellbiologie
Germany	Dr Conrad Freuling	Friedrich-Loeffler Institut
Germany	Ad Vos	Veterinary Public Health Ceva Innovation Center GmbH
Mission Rabies	Dr Andy Gibson	Mission Rabies
Thailand	Dr Kansuda Leelapongsathon	Faculty of Veterinary Medicine, Kasetsart University
France	Dr Gregorio Torres (via recorded ppt)	OIE HQ
OIE staff and interns		
France	Rachel Tidman	OIE HQ
Japan	Hirofumi Kugita	RR-AP
Japan	Kinzang Dukpa	RR-AP
Japan	Lesia Thompson	RR-AP
Bhutan	Pasang Tshering	RR-AP
Japan	Maho Urabe	RR-AP
Japan	Basilio Valdehuesa	RR-AP
Thailand	Ronello Abila	SRR-SEA
Thailand	Supalak Prabsriphum	SRR-SEA
Chinese Taipei	Anlin Wang	RR-AP intern, School of Veterinary Medicine National Taiwan University